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COMPUTERWORLD

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Product Spotlight — Businesses are considering the human touch of biometrics. Page 75.

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Net/Master engages IBM's LU6.2 protocol — something IBM's own Netview network management system has yet to accomplish. Page 10.

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Advanced Technology: Multimedia is as alluring as a pot of gold, but getting to the end of the rainbow may take a while. Page 17.

An expert system for toxicologists that can calculate the complex interactions of multiple substances earns The Lubrizol Corp. a finalist designation in the *Computerworld Smithsonian Awards.* Also, a full listing of finalists and achievement awards for H. Ross Perot and Robert Tinker. Page 16.

Hitachi stokes mainframe fires

BY J. A. SAVAGE
CW STAFF

Hitachi Data Systems Corp. heated up the competition in the mainframe market last week when it announced two high-end systems that, at up to 150 million instructions per second, overpower the biggest IBM and Amdahl Corp. systems.

However, by the time the new systems are available in the second quarter of next year, IBM and Amdahl will have probably already announced new mainframes. Given the lead time on delivery of the HDS units, the other announcements could be accelerated, with pricing and available features adjusted to compete more ably against HDS, according to analysts and users.

Mainframe buyers contended that the announcement's greatest impact will be its effect on competition, in which a price-sensitive market already favoring buyers will become even more buyer-friendly, both in terms of hardware pricing and features.

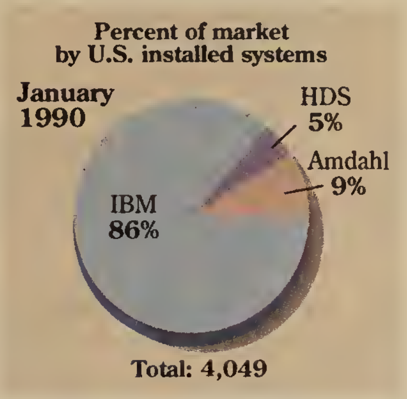
The HDS systems will "have the impact of bringing pricing down," predicted Frank Erbrick, senior vice-president of information services at United Parcel Service in Paramus, N.J. "I'll use them as leverage in the buyers' market" against IBM and Amdahl, he said.

The mainframe, the top of the HDS line, is the most powerful announced to date, but it reflects a continuation of the company's line rather than a radically new architecture. Analysts and users said they expect IBM and Amdahl to also provide incremental changes in their mainframe architectures rather than attempt revolutionary departures.

Continued on page 6

On the move

Holding only 5% of the market for installed IBM 3090-class machines, HDS is hoping to move up



Source: Computer Intelligence

Outsourcing: From fad to respectability

BY CLINTON WILDER
CW STAFF

Outsourcing promises much and can deliver on those promises — if the customer is cautious, diligent and ever-mindful of the outsourcing vendor's goal of making a profit.

That is the consensus of several information systems executives who have contracted out part of their companies' IS function in the past year, during which outsourcing suddenly went from a curious anomaly to a veritable craze. The U.S. outsourcing services market will total $4.72 billion this year and $10 billion by 1994, according to Input, Inc., a market research firm in Mountain View, Calif.

Spurred by the highly publicized moves of manufacturing giants Eastman Kodak Co. and American Standard, Inc., dozens of firms have gone to outside vendors for processing, and hundreds more are considering such a move.

Although few of the executives said they regretted their decisions to outsource and most spoke excitedly about cost savings, their enthusiasm was

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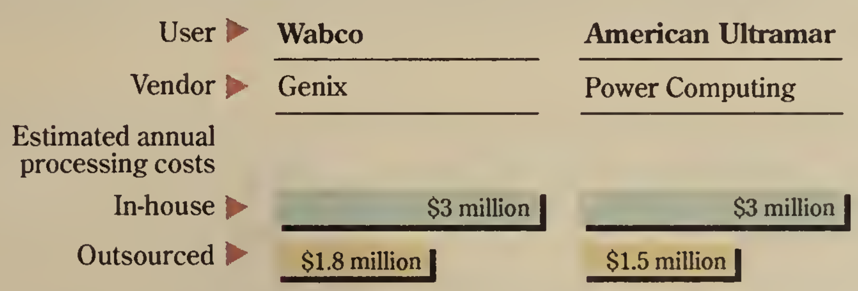
Inside, outside

Two companies estimate that their outsourcing strategies save up to 50% on annual data processing costs



Source: Wabco, American Ultramar, Inc. CW Chart: Doreen Dahle

AT&T fills Unix server cast

BY PATRICIA KEEFE
CW STAFF

ATLANTA — AT&T quickly capitalized on its star status at Comdex/Spring '90 — a role opened up by IBM's decision to bypass the trade show — by unwrapping a clutch of network-oriented products, including Unix-based file servers that promise reduced instruction set computing-based fault tolerance and symmetrical multiprocessing capabilities.

The announcement strikes a blow for Unix in the evolving server war with OS/2. Both operating systems are struggling to establish some presence on the commercial desktop but are expected to gain entry through local-area networks.

There is not much demand at this point for linking DOS boxes to Unix servers, but the market is beginning to "ripen," in part because of government interest. According to Paul Zagaeski, a senior analyst at The Yankee Group, such linkage is a potentially important market, particularly given the current status of OS/2. "One of the critical questions of the early '90s is whether OS/2 on the server will be viable along with Unix," he said.

"The goal in AT&T's mind, I'm sure, is that if they can get a

Continued on page 124

Clouds lift for 4381 successor

Users say they know all but cost, timing of 4391

BY MARYFRAN JOHNSON
CW STAFF

Patience has been a necessity rather than a virtue among IBM's 4381 and 9370 midrange customers, but the long-awaited debut of new high-end models in both computer lines should be in sight by early fall.

Interviews with customers and industry analysts last week indicated that IBM is gearing up for a massive Enterprise System/370 announcement, expected in September.

Wrapped up in this product blitz (see story page 6) are three new 9370s; three new "4391s," follow-on machines to the 4381 that represent significant enhancements to the VSE operating system; and several pieces of "Summit," the successor to the 3090J mainframe.

The impact of Hitachi Data Systems Corp.'s mainframe announcement last week could force IBM's hand even sooner, some users suggested, as HDS gains more credibility as an IBM alternative.

"I think IBM will be waiting to see what Hitachi's real announcement is and if they can do something better than that,"

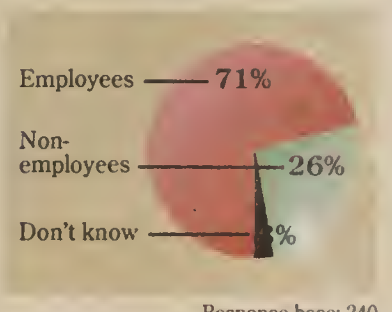
Continued on page 6

COMPUTERWORLD BUYERS' SCORECARD

Top Security Threat?

Users of the top four mainframe access control products are most concerned about transgressions by their own employees

(for product ratings see page 80)



Response base: 240

NEWSPAPER

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125 Gucci pumps and 486 chips. A status symbol's a status symbol.

Quotable

"No matter what we do, OSF is going to do something different. If we put a cheese toaster on our machine, they would put a hamburger griller on theirs."

SCOTT MCNEALY
SUN MICROSYSTEMS

On OSF's snubbing of Sun's technologies. See story page 8.

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PRODUCT SPOTLIGHT

75 There's more than one way to keep people off your system, including biometrics, expert system-driven software and dynamic password tokens.

IN DEPTH

91 Downsizing needn't be a large-scale headache. Here's how to avoid the five biggest pitfalls. By Theodore Klein.

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A *Computerworld* CEO survey a year ago found that a majority of CEOs in large companies (64% in our poll) didn't think their firms were getting their money's worth from IS investments. Now, a study of managers in midsize companies by Computer Advisory Group has found that nearly half are "unhappy" with their IS investment. The problem? IS managers can't align IS with business goals. And IS spends too much. And it communicates poorly with senior management. And IS isn't as accountable as it should be. And it's fraught with crisis management. Hey, this sounds more like the Defense Department.

The right network management setup starts with an organizational personality test. Page 53.

Cindy Charles

Back in 1973, Way Konigsberg and two friends set out to see if a computer company could do well and do good at the same time. It can. Page 98.

EXECUTIVE BRIEFING

■ **About one year after outsourcing burst onto the scene** as the hottest idea in IS, few companies regret their decision to outsource, and many have seen impressive savings in operations and network management costs. But they have plenty of advice for others considering the move. The ability to maintain control is the paramount issue: One user, NHP, Inc., lost control of the situation and ended up in court with EDS. **See stories pages 1, 122.**

■ **Yes, downsized systems can be less expensive than mainframes** when it comes to development and administrative costs. But those smaller, decentralized systems are no less complex. Too many organizations approach the downsizing process as if it were as simple as setting up PCs or LANs with individual productivity applications. The potential benefits are also great. To succeed in downsizing, information systems staff and key line managers must carefully consider and sort out a wide variety of hardware, software, communications, personnel, business strategy and business function issues. **Page 91.**

■ **Sears Roebuck's massive data center consolidation plan** is on track. Sears, which may run the world's largest SNA network, is consolidating nine data centers into three and connecting them with 45M bit/sec. lines among Schaumburg, Ill.; Columbus, Ohio; and Dallas. **Page 56.**

■ **Action is picking up in the mainframe world.** Hitachi Data Systems last week announced a high-end system that it claims outperforms the best of rivals IBM and Amdahl. Meanwhile, it appears that the multiyear wait for a successor to the IBM 4381 family is drawing to a close. Industry observers expect the new product line — which would replace the 4381 and the 9370 series — by the end of the summer. **Page 1.**

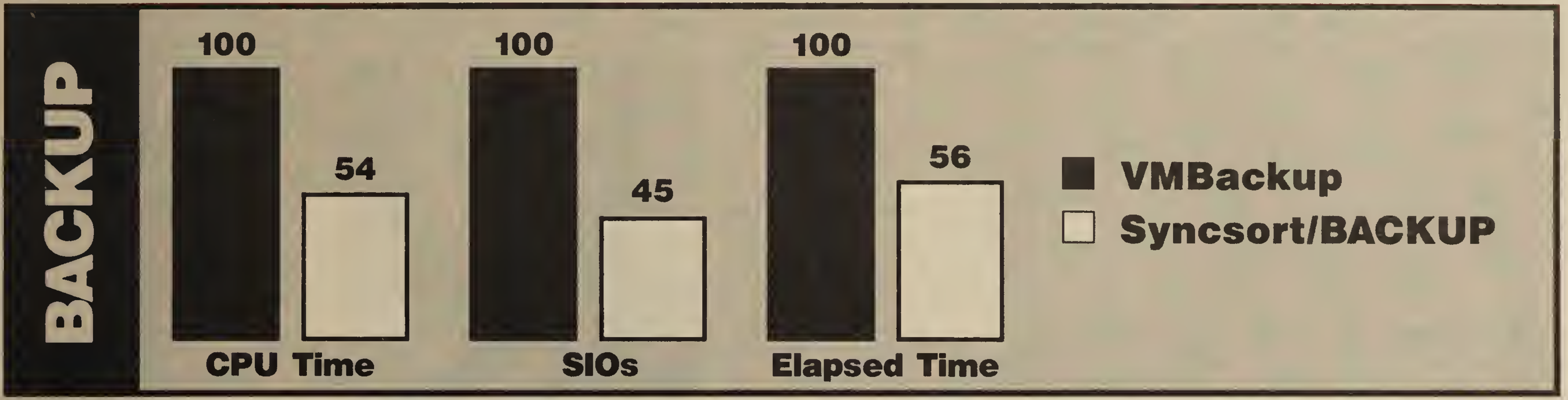
■ **People who lament the lack of qualified college grads** for entry-level IS jobs may be looking in the wrong places. Companies that loosen strict technical requirements for hiring can strike gold with students who major in disciplines outside of traditional computer science degree programs. **Page 72.**

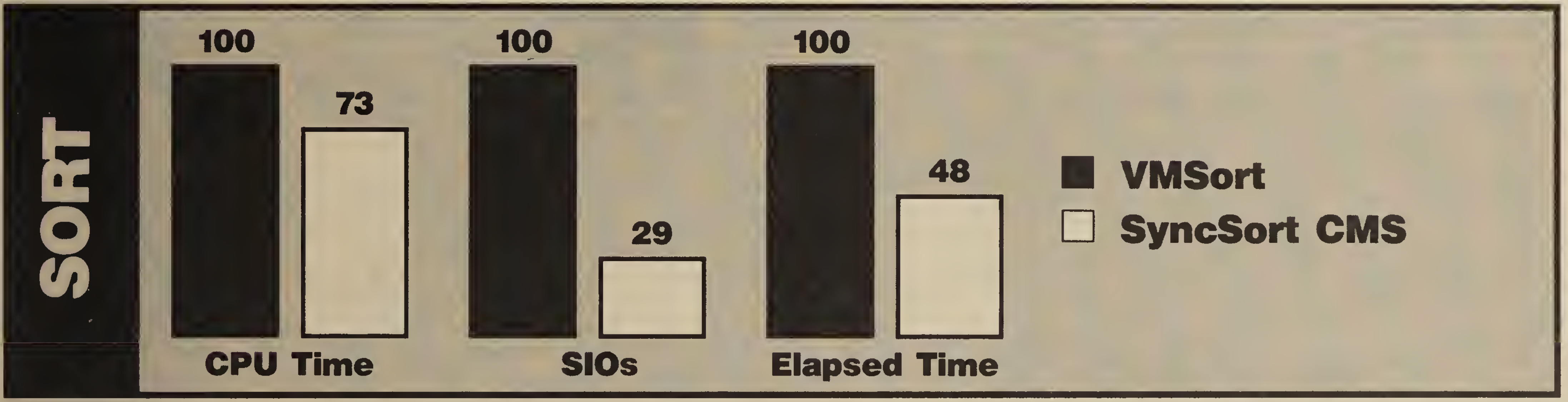
■ **Can being quoted in the press** boost an IS executive's career prospects? Some oft-quoted top IS executives say yes, and headhunters agree with them. But some equally visible managers discount the impact on careers. Both groups, however, cite numerous other reasons to deal with the press. **Page 102.**

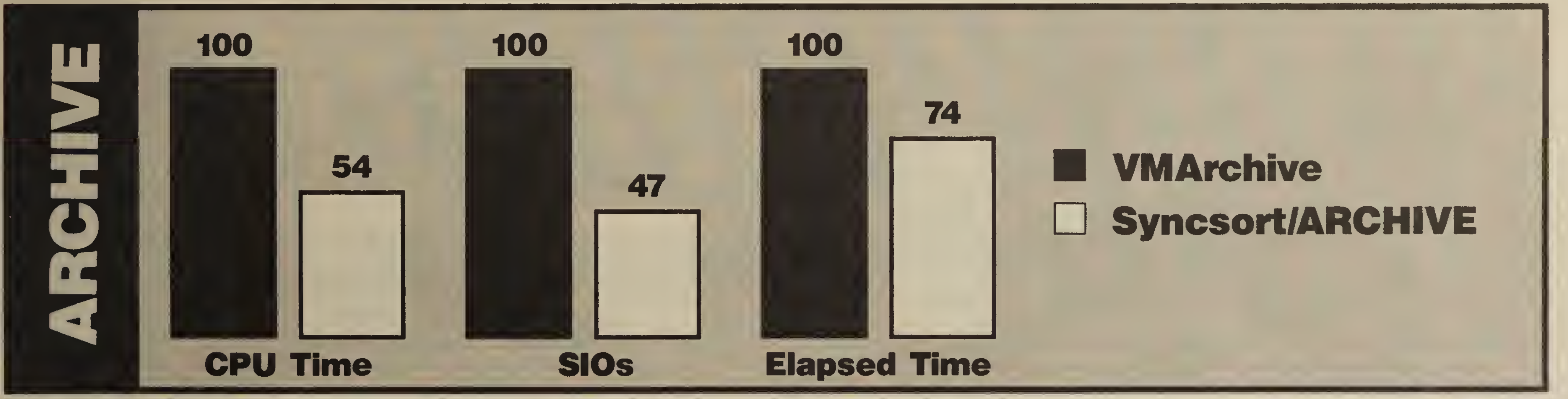
■ **Biometric approaches to access control** — using fingerprints, voice patterns or retinal movements to identify cleared computer users — didn't hold much appeal for businesses in the past. Most companies regarded them as too pricey and too "sci-fi" to be really useful. With security concerns at an all-time high, however, attitudes are changing, and biologically or behaviorally based biometric devices are finding their way into more corporate security plans, along with other interesting extras, such as dynamic password-generating tokens. **Page 75.**

■ **On-site this week:** Illegal insider traders should beware of the watchful eye of SWAT — the Stock Watch Automated Tracking system developed by the National Association of Securities Dealers. **Page 25.** The Tokyo-based, Japanese-owned K Line uses a global T1 backbone network integrating voice, data, telex and fax to provide its customers with updated locations of their shipments on the Seven Seas. **Page 53.** PC-based applications development received a boost from a Novell Netware-based LAN at Dayton, Ohio, manufacturer Monarch Marking Systems. **Page 41.**

VM PERFORMANCE FROM SYNCSORT







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WHERE PERFORMANCE IS THE ISSUE.

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NEWS SHORTS

Information industry slips

Despite a boost in revenue growth for independent companies in the information industry, the overall industry net profit margin slipped to 6.6% in the fiscal year ended March 31, compared with a 7% industry net profit margin in 1989, according to a survey conducted by Stamford, Conn.-based Gartner Group, Inc. The margin reduction was attributed to the shift toward desktop and open systems, as well as mainframe price wars and slow sales in minicomputers, said Randall Brophy, an analyst at Gartner Group.

……

CIO leaves New Jersey firm

Gary A. Provo, the executive vice-president of information systems at First Fidelity Bancorporation in Newark, N.J., has resigned, and no successor has yet been named, a company spokesman said. Provo, 42, had been IS chief at the multibank holding company for three years.

……

Businessland turns to Japan

Businessland, Inc. will open retail doors in Japan with help from Tokyo-based software distributor Softbank Corp. Their joint venture, called Businessland Japan Co., will sell products from IBM, NCR Corp., NEC Technologies, Inc. and Toshiba Corp. Businessland estimates the Japanese end-user market to be worth $13 billion by 1993, up from $4 billion in 1988.

……

House OKs antitrust exemption

The U.S. House of Representatives last week voted to relax antitrust prohibitions against U.S. and Canadian joint ventures in manufacturing. The measure would extend the provisions of a 1984 law that allowed the formation of research and development consortiums such as Sematech and Microelectronics & Computer Technology Corp. Among other things, the bill would eliminate the threat of triple damages in cases of manufacturing partnerships.

……

DEC, Sybase team for secure DBMS

Digital Equipment Corp. and Sybase, Inc. last week announced an agreement by which DEC will sell trusted database products — based on Sybase's Secure SQL Server and Secure SQL Toolset — for Ultrix-based DEC VAX computers and future reduced instruction set computing systems. Initially, the deal will focus on sales to the federal government, but it will later turn to commercial opportunities, company officials said. Secure SQL Server is a recently announced multilevel secure database management system designed to meet the National Security Agency's B1 level of trust.

……

Borland goes Borschtland

Borland International has jumped on the *perestroika* bandwagon. The maker of Quattro Pro signed a software distribution agreement with Interquadro, a joint venture consisting of Soviet, French and Italian interests. Interquadro will sell Borland software — including Turbo Pascal, already a Soviet standard — throughout the USSR. Ashton-Tate Corp. announced some of the first fruits of its Soviet venture — the first customer shipment of Framework II bundled with Informontage-4, a PC application developed by the Leningrad Institute of Informatis and Automation. The product bundles Russian/English word processing, spreadsheets, databases and graphics.

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National net to advance

The dream of a multigigabit/sec. national network is expected to gain substance today as the National Science Foundation (NSF) announces a $100 million-plus research effort funded by public and private sectors. The NSF and the Defense Advanced Research Projects Agency will be providing $15 million, while vendors such as IBM will donate equipment and software and carriers such as MCI Communications Corp. will donate local- and wide-area connections for five multisite test beds throughout the U.S.

More news shorts on page 8

Industry forerunner Robert Noyce dead at 62

BY JAMES DALY
CW STAFF

The computer community lost a spiritual father last week when Robert Noyce, who co-invented the integrated circuit and founded several of Silicon Valley's premier firms, died of a heart attack at his home in Austin, Texas. He was 62.

In recent years, the technically brilliant Noyce also became one of the industry's most prominent spokesmen when he took the helm of Sematech, a consortium jointly funded by the Department of Defense and 14 U.S. chip makers that was designed to blunt Japan's withering assault on the microchip field he helped create.

Noyce was only 32 when he and Texas Instruments, Inc.'s Jack Kilby simultaneously and independently developed the integrated circuit, putting multiple transistors on a single piece of silicon and replacing room-size computers with a chip the size of a fingernail.

Noyce was so widely respected for his scientific achievements — he held 16 computer chip patents — that he became known as "The Mayor of Silicon Valley." "He was always available to tackle the impossible task," said Mitchell Kerztman, chairman of the American Electronics Association.

Noyce, a graduate of Grinnell College and MIT, was one of a handful of young scientists and engineers recruited in the mid-1950s by Nobel prizewinner William Shockley, the inventor of the transistor, to set up the first semiconductor company — Shockley Semiconductor Laboratory. In 1957, Noyce helped start Fairchild Semiconductor Corp. in Mountain View, Calif., and in 1968, he and Gordon Moore co-founded Intel Corp.

Noyce became known *as "The Mayor of Silicon Valley"*

In 1988, Noyce came out of retirement to head up Sematech. As for his decision to take a new career path at age 60, the energetic Noyce replied: "I thought about missing some skiing, but then I said, 'Don't you think this is more important?' "

Noyce reportedly suffered a heart attack shortly after completing a morning swim.

Sematech spokesman Joe Stroop said that a three-member executive team will run the consortium until a new president is selected.

Travel agents nailed by FBI

BY JEAN S. BOZMAN
CW STAFF

LOS ANGELES — Two travel agents were charged with conspiracy and wire fraud last week in connection with an alleged scheme to set up false frequent-flier accounts in American Airlines' Sabre computer reservations system.

The 22-count indictment filed last week stems from a Federal Bureau of Investigation probe. Assistant U.S. Attorney Gary S. Lincenberg alleged that the agents set up fictitious frequent-flier accounts on the Sabre system from 1986 to 1988.

The indictment said that the agents used real passenger flight records to pile up frequent-flier miles in the false accounts. The agents then allegedly applied for frequent-flier award coupons and sold these coupons for cash.

An American Airlines spokesman would not comment on the charges involved in the case.

James Robert Winkleman, 35, and Phillip Ross Rinker, 35, both of Woodland Hills, are scheduled to be arraigned June 18. Their attorney was not available for comment on the case.

In an unrelated case, the Los Angeles U.S. Attorney's office also announced that a man claiming to be a North Hollywood accountant pleaded guilty to charges that he filed false Internal Revenue Service claims, using a new federal program that allows tax returns to be filed electronically. Tanleen Mashfu, 25, will be sentenced Aug. 13.

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IBM sketches future of dedicated processors

BY ROSEMARY HAMILTON
CW STAFF

NEW YORK — IBM last week said its future mainframe generations will replace the mammoth systems we know today with processors dedicated to select operations.

In a briefing to analysts on Friday, IBM was short on detail for these future systems and did not discuss the 3090 follow-on, expected later this year, according to analysts who attended.

"This was a view of the future, rather than current events," said Rick Martin, an analyst at Prudential-Bache Securities, Inc. "IBM was talking about mainframes becoming more customized to the individual customers."

IBM's briefing came just two days after Hitachi Data Systems Corp. took its most direct shot to date at the high end of the 3090 line. However, analysts said the IBM meeting had been planned well before the HDS announcement and was not a response to the new mainframe competition.

However, analysts said IBM indirectly addressed its competition by suggesting that a product line of many dedicated and integrated mainframe processors will be tough for the plug-compatible manufacturers (PCM) to duplicate.

"As they go off in lots of different directions, it will be harder for the PCMs to keep up," said Cliff Friedman, a vice-president at Bear, Stearns & Co. "The PCMs will be able to compete in certain areas but won't be able to offer the breadth of product."

IBM said it will begin to move toward the dedicated-processor product line during the next 12 to 18 months, according to analysts. IBM did not indicate what will be delivered in that time frame, and it also did not specify what role the so-called Summit system will play in this plan.

Eventually, IBM hopes to provide processors for such dedicated tasks as database management, data sorting and security, Martin said.

"What we heard was encouraging," Friedman said. "They are trying to reach out of the glass house with their high-end systems. The ones we know today are not the same ones we'll see five years from now."

Hitachi

FROM PAGE 1

Jim Cassell, an analyst at Gartner Group, Inc. in Stamford, Conn., said the only significant new feature with IBM's next announcement — which he referred to as the "J Prime" — is fiber-optic channels. He called the J Prime the "half-step" toward IBM's long-awaited next-generation Summit mainframe, which some analysts speculated will be announced later this year.

Analysts also speculated that IBM has made a marketing decision to announce immediate delivery of the so-called J Prime, positioning it as a precursor to Summit, which is expected to have a broad array of new features while staying within IBM's 370 architecture.

The HDS computers feature three- and four-processor configurations. Respectively, the EX 310 is clocked at about 123 MIPS and the EX 420 at 150 MIPS, according to Mark Hess, a Gartner Group analyst. HDS also renamed its existing AS/EX line as the EX series and added the EX 85, which does not use the more powerful CPUs of the high-end systems and which, at about 56 MIPS, fits between the current EX 80 and 90 models.

HDS squeezed more power out of its architecture by "packing the circuitry closer together and speeding the internal connections," HDS President Gary Moore said.

Over the top

Hitachi Data Systems hopes to bolster its market presence with plug-compatible mainframes that are more powerful than IBM 3090s

	HDS EX 310	HDS EX 320	IBM 3090/600J
Processors	3	4	6
Maximum main memory	2G bytes	2G bytes	512M bytes
Maximum expanded storage	4G bytes	8G bytes	4G bytes
Relative performance to EX 100	1.4x	1.7x	N/A
Industry MIPS estimates	124	150	112
Availability	Second quarter, 1991	Second quarter, 1991	Currently
Price	$11.6 million	$14.4 million	$13 million

Source: Hitachi Data Systems Corp. and IBM

CW Chart: Paul Mock

The trade-off is that the computers must be liquid-cooled to keep the densely packed circuitry from overheating. If users already have plumbing in their computer rooms, HDS' mainframes will have standard connections to it — using water cooling. If a user has no plumbing, HDS will make available self-contained refrigerant-based radiator units that require no external plumbing. Current HDS computers are air-cooled.

Other features include fiber-optic channels that can connect peripherals at distances up to 1.2 miles at 4.5M byte/sec., a remote operations facility that offers support through IBM Netview-managed consoles and an eightfold increase in the number of peripheral devices supported, up to 24,000.

Taking trade-ins

Upgrades from existing machines will require a box swap, but HDS said it will take a trade-in on the old CPUs and discount for the old configurations; the customer would pay only for additional performance and features. Users will also be able to maintain the same serial number on their current computers, eliminating the need for new software licenses, HDS claimed.

Analysts and users said HDS is setting the parameters — such as speed, features, price and upgrade policy — for IBM and Amdahl to exceed later this year with their expected new mainframes.

"It will probably drive IBM on their final decision," David Moore, senior vice-president of Mellon Bank said.

"This really puts some heat on IBM," agreed Jack Cooper, president of CSX Technology, the information systems division of CSX Corp.

As high-end IBM users, both Moore and Cooper had their curiosity piqued by the HDS announcement, and both said they are considering the HDS entries, among others. Cooper said that if the new computers pass benchmark tests, he would purchase an HDS machine without hesitation.

While users may be anxious for a shakeup in mainframes, Amdahl maintained that its new computers will not be affected by the HDS announcement. An IBM spokeswoman said the company will not comment on competitors, although Friday it was hosting a meeting with analysts to discuss its mainframe directions.

There is no question, however, that IBM continues to control mainframe architecture. Steve Josselyn, an analyst at International Data Corp. in Framingham, Mass., noted that IBM has talked about fiber-optic channels, and HDS may have to subsequently rewrite its own channel interfaces in response to an IBM implementation.

Senior Editor Rosemary Hamilton contributed to this report.

IBM 4391

FROM PAGE 1

said George Perera, group director of MIS operations, technology and administration at Ryder Truck Rental, Inc. in Miami.

Ryder is one large IBM customer site that could not wait for the new high-end 4391, which many users have been expecting since late 1988. There are 16,800 installed 4381s — 8,000 in the U.S. and another 8,800 abroad, according to Technology Investment Strategies Corp. in Framingham, Mass.

"We were at the top of our 4381 in one area, so we consolidated the work into a larger 3090 environment and made the conversion from VM to MVS [operating systems]," Perera explained.

He and other users said they believed that the 4391 has been ready for some time now but that IBM withheld it, hoping that more users would move upward onto 3090 mainframes. An IBM spokesman said the company would not speculate on unannounced products.

No surprises

Yet customers seem to know what to expect from IBM's next midrange move.

"I know everything about these boxes but the price," said Ronald Schrodt, vice-president of materials and information systems at Rheem Manufacturing Co. in Fort Smith, Ark. "We plan to jump on the list the first day they're taking orders."

Like many 4381 customers, Schrodt said he is counting on the new models to keep his company away from the 3090 line. "We have a good deal of money and time invested in our applications. We need more power to run them, but we don't want the expense curve of the 3090," he explained.

Met 'maxed out'

At the Metropolitan Museum of Art in New York, data processing manager Bob D'Urso is "maxed out" on his 4381, 4361 and 9375 machines. The museum is considering the purchase of a used 3090 Model 150 but may wait to examine the 4391, D'Urso said.

"We really need a mainframe-size system, and our space is very limited," he added.

Terry Lowder, vice-president of technology research at Banc One Services Corp. in Columbus, Ohio, said he expects the 4391 to be available in the fourth quarter of this year.

"We're really waiting to see the pricing on maintenance and software to see if we can afford to distribute our [IBM Check Processing Control System] to a 4391," Lowder said.

The new air-cooled midrange models are expected to relieve pent-up demands among 4381 and 9370 users for higher performance and greater capacity — without the environmental problems raised by the water-cooled 3090 line.

"I'm expecting to see capabilities on the 4391 that you would expect on a much larger system," Lowder said.

Whatever IBM calls the new machine, customers and analysts said they expect the 4391 to become part of the Systems Application Architecture strategy.

"These 4391 customers are the people IBM is hoping to grow into the Summit machine," said Susan Gannon, an analyst at Technology Investment Strategies.

Great expectations

One of the worst-kept secrets among IBM customers these days is the set of features expected in the new models topping off the 4381 and 9370 lines, as well as the improvements to the VSE operating system.

The following are some highlights of the anticipated changes:

- The so-called "4391" — likely to be renamed by IBM — is expected to arrive in three models, delivering 10, 16 and 22 million instructions per second (MIPS) and priced from $65,000 to $75,000 per MIPS.

In processing power, the new models will be equivalent to low-end 3090 models but cheaper by as much as 45%.

- The 9370 line will get two or three new high-end models offering an upgrade path from the Model 90. Users can expect two to three times the performance of the 2.5-MIPS Model 90, as well as the ability to run Enterprise Systems Architecture (ESA), Systems Managed Storage and expanded storage.
- VSE customers should gain some of the functionality of MVS/ESA, allowing them to run larger applications, have greater data integrity and increase throughput.

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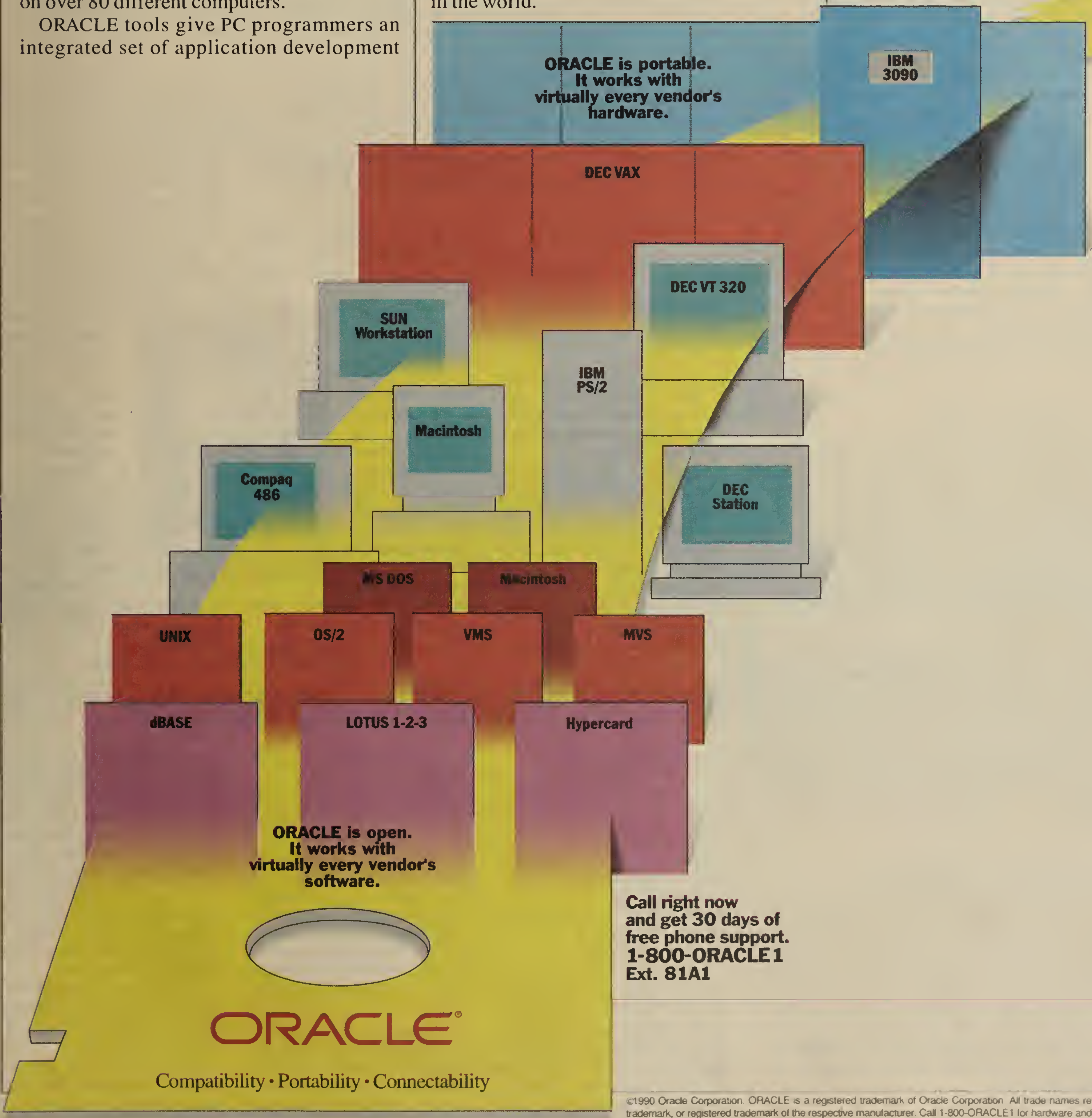

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NEWS SHORTS

D&B says cuts are complete

Layoffs, known at Dun & Bradstreet Software as severances, are over. All those who are to be "severed" had been notified of their situation as of June 1, a D&B Software spokesman said. The total count of severances handed out in the U.S. by the company is approximately 225: 125 notices were served to former McCormick & Dodge employees, and about 100 were served to former Management Science America, Inc. employees, the spokesman said. The company cited 75 positions that were eliminated through attrition so far, but some employees claim that D&B's figure is too low.

....

Court rejects combos

A federal appeals court last week knocked down a 1985 Federal Communications Commission decision to allow the regional Bell operating companies to combine their regulated and unregulated businesses. Such combinations were prohibited by the consent decree that broke up AT&T because they were thought to lead to cross-subsidies and other anticompetitive activities. It was also thought that "structural separation" would encourage the development of computer-based services by the phone companies and their competitors. The appeals panel sent the matter back to the FCC for another look, saying the commission had based its decision on insufficient information and had not shown that the risk of anticompetitive abuse had abated.

....

X/Open issues stamp of approval

X/Open Consortium Ltd. launched a major branding program last week designed to identify which open systems products conform to the latest X/Open Portability Guide (XPG) specifications. The first XPG3 brands were awarded to products from 12 U.S. and European companies, including AT&T Computer Systems, Groupe Bull, Digital Equipment Corp., IBM, Siemens AG and Unisys Corp. The X/Open brand is reportedly backed by strong technical and legal conditions. X/Open is an independent, nonprofit corporation made up of international computer vendors, user organizations and software suppliers.

....

DEC offers Motif tool kit

DEC introduced a tool kit last week designed to help developers convert their DEC-based X User Interface to OSF/Motif. The Decwindows Developer Kit, available now, is the second of DEC's four-stage process to make OSF/Motif the default graphical user interface for Decwindows applications running on either a VMS or Ultrix platform, a company spokesman said. Meanwhile, mainframe maker Amdahl Corp. announced a Motif porting agreement under which Integrated Computer Solutions, Inc. in Cambridge, Mass., will pair its The Builder Xcessory with Motif for Amdahl systems.

....

HP enhances operating system

Hewlett-Packard Co. last week announced a new release of the proprietary MPE/XL operating system, Version 2.1, which will give all HP 3000 computers greater connectivity with IBM's Systems Network Architecture. At the same time, the firm added an entry-level HP 3000, the Series 920, reducing the price of entry to the reduced instruction set computing-based line to $28,000.

....

Suit seeks to open database

Dialog Information Services, Inc., a provider of information retrieval services to scientific, academic, business and government researchers, asked a federal court last week to order the American Chemical Society to provide full access at reasonable rates to its database of chemical information. Dialog charges that restrictions on access to the database, which was developed with the aid of more than $15 million in federal funding, violates antitrust laws and prevents free and open competition between the society and other suppliers of on-line chemical information. The database reportedly contains literature on more than 10 million chemicals.

Users meet with Prime elite

BY SALLY CUSACK
CW STAFF

ORLANDO, Fla. — Almost 1,000 of the faithful gathered last week at the 13th annual National Prime Users Group (NPUG) convention, intent on swapping ideas and attending technical seminars with fellow engineers and developers.

John J. Shields, Prime Computer, Inc.'s president and chief operating officer, devoted most of his keynote presentation to reassuring attendees that the Natick, Mass.-based company still has financial potential in the marketplace.

With $1.52 billion in revenue for 1989, Prime showed $48.3 million in operating earnings before depreciation and amortization in the fourth quarter. For 1990 through 1992, annual research and development expenditures are planned at 15% to 17% of product revenue, Shields said.

While attendees appeared cautiously optimistic about Prime's future, most were eager to share information with other users and get answers to specific technical questions from the Prime staff.

"It's our chance to rub shoulders with the wizards writing the code," said Dan P. Olsen, supervisor of network support at Montana Power Co. "Every year, Prime makes more of these people available to the user base, and NPUG is a good place to get answers that you can't get anywhere else."

Jim Whitehead, an engineer at American Electric in Memphis, indicated that he was exploring different ways to use the Medusa system in a product design capacity and that he really enjoyed hearing what other Medusa users had to say. Medusa is a computer-aided design platform from Prime.

At the beginning of the conference, Shields also promised customers choices in the future by reaffirming Prime's commitment to extend its 50 series 32-bit superminicomputers and provide users with a Unix platform.

"I'm basically here to see what they have to offer," said Kevin Henry, a systems administrator at Nash-Kinema, Inc., a manufacturing company in Elizabeth, Pa. "We're looking to upgrade our Prime 2350 and 2450 platforms to the 2850 environment."

Sun still glowers over the OSF's contrariness

BY JOANIE M. WEXLER
CW STAFF

BOSTON — In all fairness, it was a member of the press — not Sun Microsystems, Inc.'s opinionated Chief Executive Officer Scott McNealy — who first broached the subject of the Open Software Foundation (OSF) last week at an event honoring the five-year anniversary of Sun's East Coast facilities.

However, when asked to comment on the OSF's snub of Sun technologies for integration into its planned Distributed Computing Environment, McNealy needed no second invitation. Dubbing the OSF "Oppose Sun Forever," he asserted that "no matter what we do, OSF is going to do something different. If we put a cheese toaster on our machine, they would put a hamburger griller on theirs."

Scoffing at the OSF's concept of "openness" and "standards," McNealy defined a standard as a technology with a large installed base. Examples of standards, he said, are Sun's own remote procedure calls (RPC) for distributed application processing and its Network File System (NFS), which together represent more than one million installations.

Sun's McNealy: *Will OSF 'oppose Sun forever'?*

The OSF, however, takes a slightly different view, purporting to encourage standards on software that is technically superior. The OSF announced last month that it had selected Hewlett-Packard Co.'s RPC and Transarc Corp.'s AFS host file tracking system (NFS's counterpart) instead of Sun's software.

While there has been much industry debate about the RPC and file system selections, McNealy seemed to mainly mourn the jilting of Sun's Open Look graphical user interface for the OSF's Motif counterpart.

"There isn't one company in the industry dedicated to making Motif fly," he said. "There are 10 [thousand] to 12 thousand developer kits out there for Open Look vs. about 1000 for Motif."

Western Union down to the wire

BY ALAN J. RYAN
CW STAFF

UPPER SADDLE RIVER, N.J. — The weight of Friday's whopping $51 million interest-due payment is pressing in on Western Union Corp., but the messaging company is keeping mum on whether or not it will meet the payment deadline.

"We are not in a position to say now what will happen on June 15," said spokesman Warren R. Bechtel last week. However, he added, the company does have a 30-day window beyond June 15 to make the interest payment on junk-bond debt without incurring default, which could force the company to seek Chapter 11 bankruptcy protection [CW, May 7].

In the meantime, Western Union has revised some terms in the recapitalization plan it had filed with the Securities and Exchange Commission in late April. The company also postponed its annual meeting — in which shareholders will vote on the possibility of reclassing certain preferred shares to common shares — from June 12 to July 6.

Western Union is proposing to exchange new notes and common shares for up to $530 million principal amount of its outstanding debt securities as part of the recapitalization plan it submitted to the SEC.

In the revised proposal, submitted to the SEC last month, Western Union is seeking to restructure its junk bond debt notes — which bear 19.25% and 16% interest rates — for notes bearing 13% and 8% interest rates and longer maturity periods. The debt stems from the 1987 takeover of Western Union by financier Bennett LeBow, financed by junk-bond king Drexel Burnham Lambert, Inc.

The earlier proposal filed with the SEC called for even lower interest rates and longer maturity periods.

Analysts following the firm said the note holders will likely agree to the proposal rather than get little or nothing if the firm were forced into bankruptcy.

Closing Arguments

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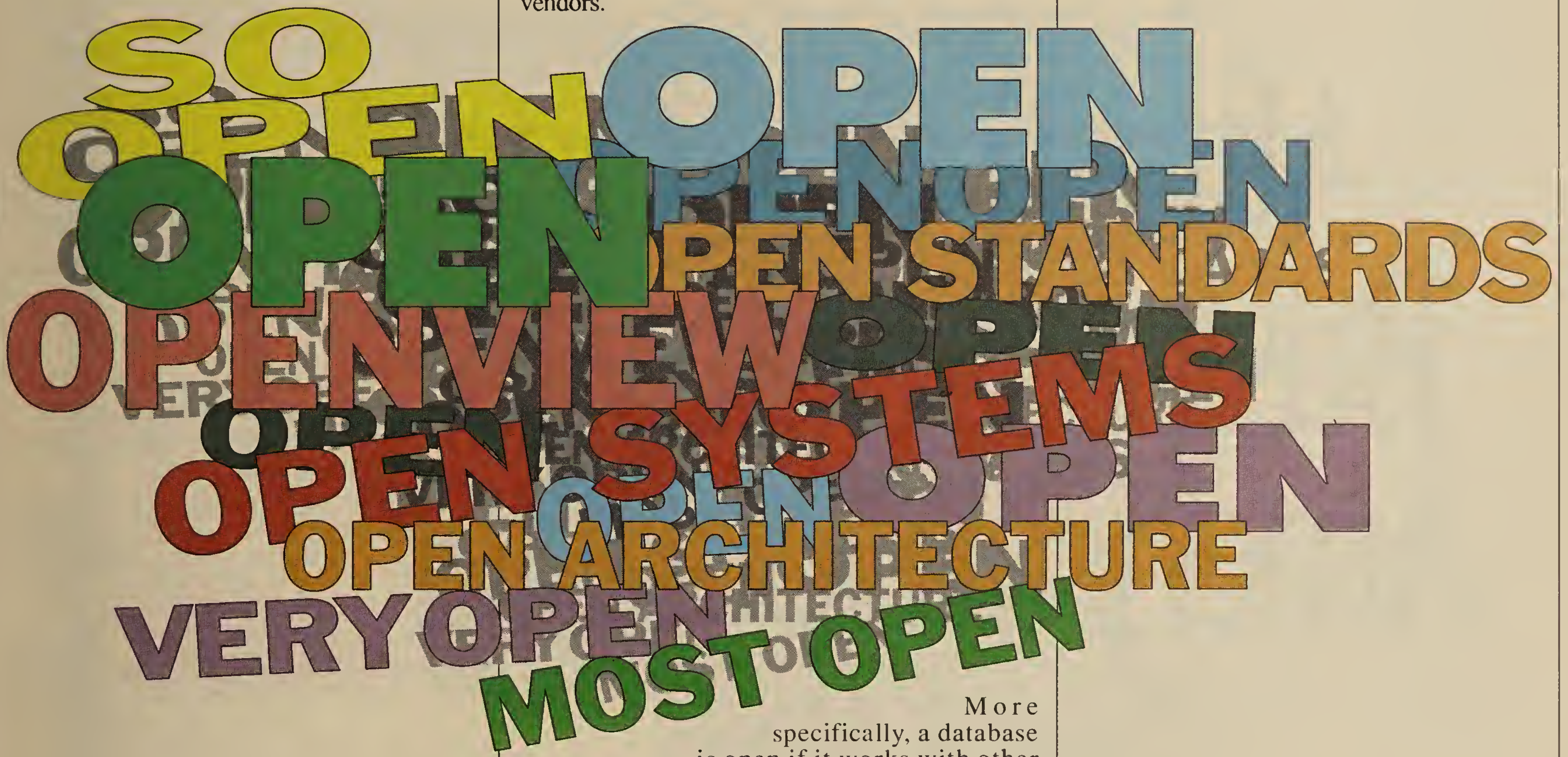

More specifically, a database is open if it works with other vendors' databases. For example, ORACLE provides access to IBM's DB2, SQL/DS and DEC's RMS.

An open database should also work with other vendors' applications. ORACLE works with DEC's All-in-1, DG's CEO, IBI's Focus and SAS. And it supports PC and Mac software like Lotus 1-2-3, WordPerfect, Borland's Paradox and Apple's Hypercard. Even Dbase applications run on ORACLE.

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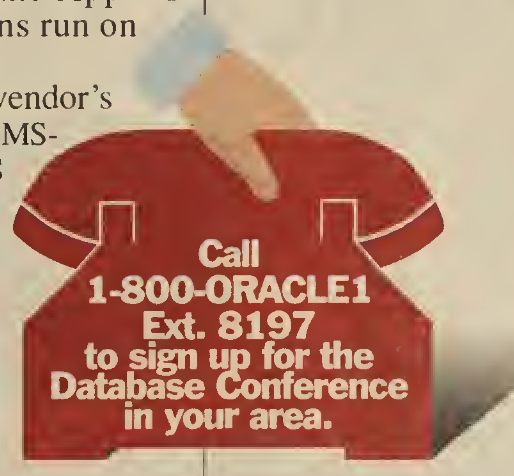

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Enhanced Net/Master lobs ball into Netview court

BY ELISABETH HORWITT
CW STAFF

DALLAS — The day after it completed its acquisition of Net/Master last week, Systems Center, Inc. unveiled the long-awaited Release 2.2 of the network management system at its user group meeting.

Net/Master is already considered by many users to equal or even surpass Netview in terms of managing IBM host-based networks [CW, Feb. 5]. Systems Center is working hard to extend the system's management domain, according to Chief Executive Officer Robert Cook.

"Net/Master automates systems operation all the way to dim lights in IBM environments; it needs to evolve to [manage] premises, environmental, LAN and voice as well as data systems," Cook said.

Systems Center, which previously had obtained the licensing rights for the Net/Master product from Cincom Systems, Inc., formalized its acquisition of Net/Master developer Software Development International Pty. Ltd. (SDI) last week.

Several key Net/Master Release 2.2 enhancements were geared to make it easier for third-party vendors to send management data to Net/Master. The new version is said to support peer-to-peer communications using IBM's own LU6.2 protocol — a capability that IBM has yet to formally announce for Netview, an IBM spokesman said.

The significance of LU6.2 support will be if it allows users to distribute Net/Master control among different control points that can then communicate with one another about the status of their respective networks. "If Systems Center/SDI has done this, they will be ahead of Netview," which still calls for a hierarchical rather than distributed management system, said Joe Mohen, president of Seacliff, N.Y.-based consulting firm Teleprocessing Connection.

Systems Center is indeed "looking for a peer-to-peer implementation of management and control, so that users can move the control point" from node to node, SDI managing director John Robinson said.

Systems Center also announced mapping services that will reformat incoming messages from other vendors' equipment so that Net/Master can process them, Cook said. A controlled release of the services is due out in the first quarter of next year. The user group meeting also saw the U.S. launch of Systems Center/SDI's Information Management, a suite of applications for problem, change and configuration management.

Affiliated Banks Services Co. is one Net/Master user that waited in vain for SDI to come out with those applications, according to the firm's manager of technical services, Ronald Robeck. The firm's technical staff was unimpressed with Net/Master's existing tool set for developing such systems and has since purchased Netman from Computer Associates International, Inc., Robeck added.

In a further development, Robinson said that an Australian Net/Master customer is testing a prototype OS/2-based system for managing token-ring local-area networks through Net/Master. The product will be able to talk to Netview as well and will provide information on soft and hard errors, isolate faulty nodes and perform path testing, he added. The U.S. release date is scheduled for early next year.

> "IF SYSTEMS Center/SDI has done this, they will be ahead of Netview."
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> TELEPROCESSING
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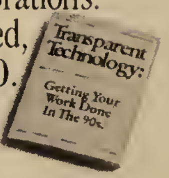

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AZ	Phoenix	Jul 24f Jul 24
	Sierra Vista	Jul 19c July 19
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CA	La Jolla	Aug 2c Aug 2
	Los Angeles	Jul 31f Jul 31 Jul 31i Aug 21f Aug 21
	Newport Beach	Jul 17f Jul 17 Aug 16c Aug 16
	Riverside	Jul 12f Jul 12
	Sacramento	Jul 26f Jul 26
	San Diego	Jul 17f Jul 17 Jul 19f July 19
	San Francisco	Jul 12e Jul 12 Aug 9f Aug 9l
	Santa Clara	Jul 18 Jul 18l Aug 17c Aug 17f
CO	Denver	Jul 19f Jul 19
CT	Stamford	Jul 24f Jul 24
DC	Washington	Jul 24c Jul 24 Aug 7 Aug 21 Aug 21s
FL	Jacksonville	Jul 19f Jul 19
	Melborne	Aug 16c Aug 16
	Miami	Aug 14 Aug 14l
	Tampa	Jul 13f Jul 13
GA	Atlanta	Jul 10f Jul 10
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ID	Boise	Jul 26
IL	Chicago	Jul 17c Jul 17 Aug 2f Aug 21 Aug 21i Aug 21l
IN	Ft. Wayne	Jul 24f Jul 24
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	St. Louis	Jul 19f Jul 19 Aug 16
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NV	Las Vegas	Aug 14
NY	Buffalo	Jul 24f Jul 24
	New York	Jul 11f Jul 11 Jul 25c Jul 25e Jul 25 Jul 26l Aug 15 Aug 15l Aug 29 Aug 29i
	Syracuse	Jul 26f Jul 26
OH	Cincinnati	Jul 12
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COMPUTERWORLD

Westinghouse system draws lawsuit

BY ELISABETH HORWITT
CW STAFF

Westinghouse Communications Software, Inc.'s recently announced integrated network management system is the target of a $195 million suit by a software developer who claimed that the Westinghouse Electric Corp. subsidiary knowingly purchased his stolen software and incorporated it into the system.

In the suit filed in March 1989 and now apparently headed for trial, John McCann alleged that his former employer, Oliver P. MacKinnon — now chief executive officer of Westinghouse Communications — cheated him out of his rightful share of the profits from telecommunications management software he developed for MacKinnon's company, Communications Design Corp. According to McCann, MacKinnon falsely claimed that the company had abandoned all plans for marketing the software, leading McCann to give up on the venture.

Three days after McCann filed his suit, Westinghouse purchased Communications Design and its assets. In January, Westinghouse Communications and Ameritech jointly announced CMS II, an integrated network management platform that incorporates Communications Design software that McCann claimed is largely his. Westinghouse Communications, aware of McCann's claim when it acquired Communications Design, put $8.5 million in escrow as protection against possible liability.

In response to McCann's allegations, MacKinnon said that McCann is a disgruntled employee who was dismissed because he "had no qualifications to do the programming that he manifested as his own." According to the defendants' attorneys, Winthrop, Stimson, Putnam & Roberts, Communications Design paid other programmers $4 million to develop the products that McCann claimed are his.

Late last month, a U.S. District Court judge in Connecticut denied the defendants' motion that the case be dismissed on statute of limitation grounds since, they alleged, McCann has had all the facts that form the basis of his complaints for eight years. The judge ruled that whether McCann actually had prior knowledge "is too inherently factual" to provide a basis for a summary judgment, leaving the question to be determined during trial, according to MacKinnon's attorney, Richard A. Horgan.

Horgan said that the defendants plan to move for a separate hearing of their motion to dismiss.

Proteon to offer 16M-bit router

BY JOANIE M. WEXLER
CW STAFF

WESTBORO, Mass. — A respectable market for 16M bit/sec. token-ring backbone networks is emerging, industry observers said, alongside a decided trend toward IBM shops needing to communicate with the rest of the networking world. To accommodate this scenario, Proteon, Inc. today plans to unwrap a less than $10,000 device that ties IBM Systems Network Architecture (SNA) networks into mixed local- and wide-area environments.

The P4100+ multiprotocol bridging router is said to combine source-route bridging — a function necessary for picking up SNA traffic from a gateway linking to an IBM host — with multiprotocol routing and support of multiple network interfaces.

The product reportedly interfaces with industry-standard 4M and 16M bit/sec. token-rings, 10M bit/sec. Ethernet networks and proprietary token-rings from Proteon and Hewlett-Packard Co.'s Apollo division. It also links to T1, X.25 and 64K bit/sec. wide-area communications lines.

"There have been lots of bridges around [for connecting SNA environments], but Proteon has put a source-route bridge on top of a router engine, which is a much better idea," said Etienne Taylor, vice-president of Pacific Information Systems, Inc., a Pleasanton, Calif., integration company.

"Nobody else has such a product for 16M bit/sec. token-ring," added Michael Howard, president of Infonetics Research Institute, Inc., a consulting firm in San Jose, Calif. He said that a recent Infonetics study suggested a strong market for 16M bit/sec. token-ring as an interim step between 10M bit/sec. Ethernet and the emerging, order-of-magnitude-faster Fiber Distributed Data Interface (FDDI), a 100M bit/sec. fiber-based token-ring local-area network.

"The 16M [bit/sec.] market is huge in IBM shops," Taylor said. "It's way too early for FDDI in the commercial market — businesses worry about making money first, not playing with topology."

Proteon said prices are $5,195 for a base P4100+ platform and $6,995 to $9,995 with bundled protocols. The P4100+ will reportedly be available this summer.

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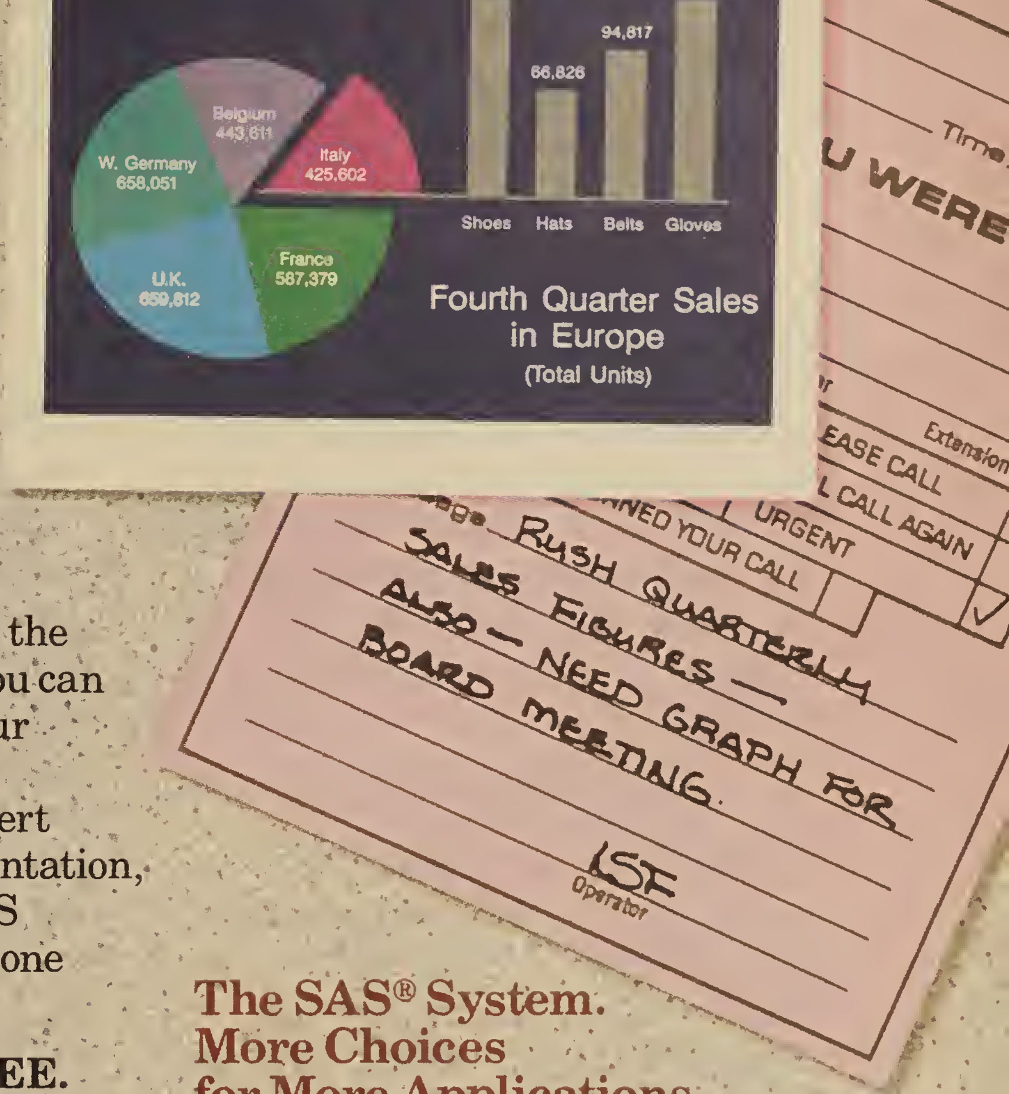

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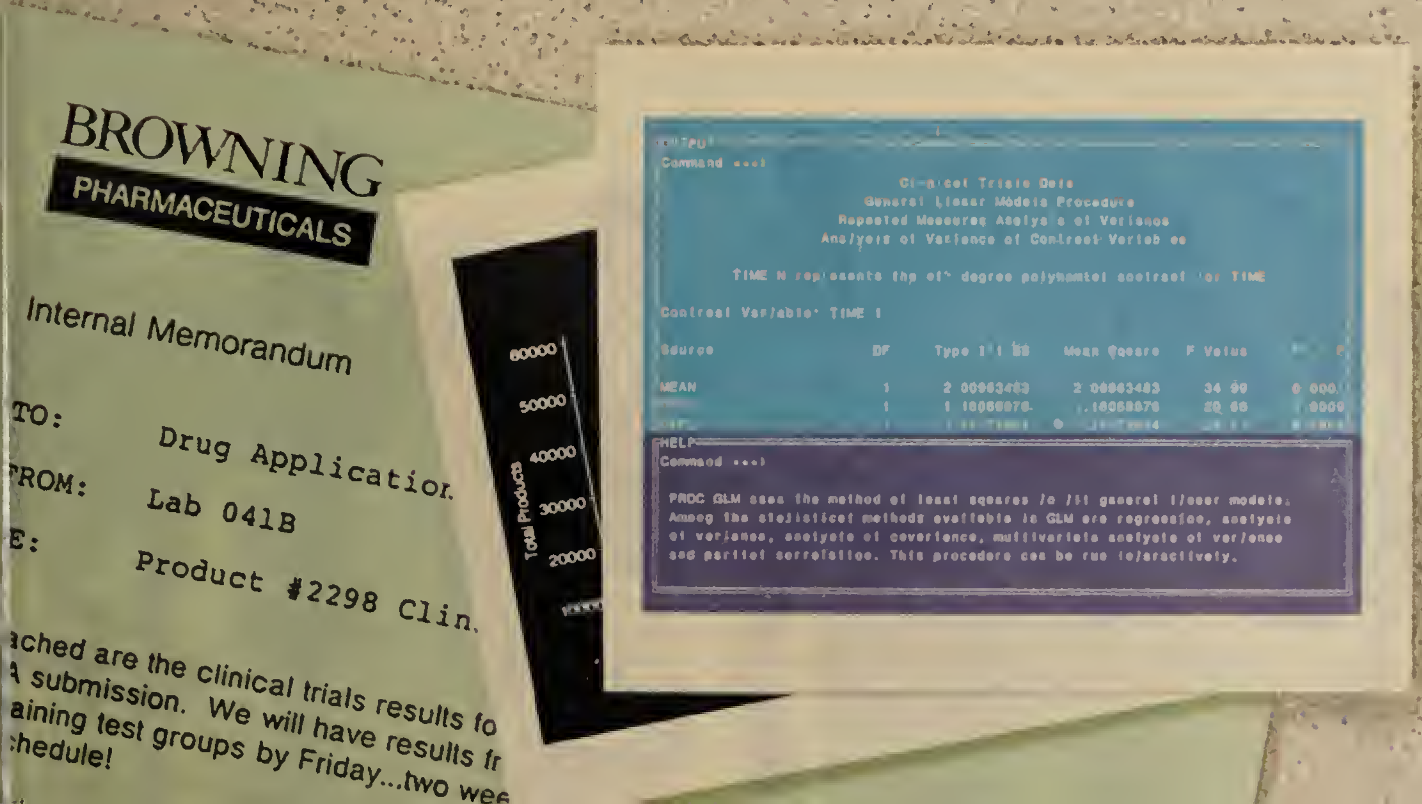

BROWNING
PHARMACEUTICALS

Internal Memorandum

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FROM: Lab 041B
E: Product #2298 Clin

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Formula for an expert solution

Lubrizol's expert system compiles database on chemical interactions

Editor's note: The second annual Computerworld Smithsonian Awards, recognizing individuals and organizations that have achieved outstanding progress for society through the use of information technology, will be awarded in a ceremony to be held June 25 in Washington, D.C. This week, Computerworld profiles one of the finalists in the category of Manufacturing.

BY ELISABETH HORWITT
CW STAFF

WICKLIFFE, Ohio — If you combine two flammable chemicals, is the resulting compound more flammable, and if so, how much more? What about the toxicity of a product that combines three toxic chemicals? And what can be done to save the life of someone who has ingested that product?

Chemical companies must answer these questions accurately and completely for each of their products — both for the safety of their customers and employees and to meet regulations imposed by the Occupational Safety and Health Administration. That is no simple process, according to Giorgio Sorani, who heads up the information systems division at The Lubrizol Corp.

Until recently at Lubrizol, "a toxicologist who is also a chemist" took days and sometimes weeks to apply complex rules for determining the properties of a new chemical compound in order to generate a detailed document called a Material Safety Data Sheet, Sorani said.

By capturing toxicologists' knowledge in an expert system, however, Lubrizol was able to develop a program that could perform the calculations and generate a data sheet automatically once the basic chemical properties had been fed into the system. The application relieved highly paid experts of a time-consuming job that was "essentially mundane for them," Sorani said. It also made Lubrizol a *Smithsonian Award* finalist.

A chemical expert is still needed to input key information about a new compound, but once that is done, an ordinary user can use the system to generate a data sheet in 24 hours, Sorani said.

While other chemical companies have systems that automate part of the job of generating data sheets, Lubrizol's application is unique in that it has captured the knowledge of how to calculate the complex interactions of multiple substances. "Even minor changes in the specific composition of a material require you to recalculate the chemical or hazardous characteristics and redefine the data sheet," Sorani said.

Bruce Zake

Lubrizol's Sorani: *Expert system relieved the experts of tedious duties*

Lubrizol started looking for a way to better automate data sheet generation about two years ago. At the time, the number of products being marketed and tested by the company was increasing so rapidly that in order to keep up with demand for data sheets, Lubrizol had to either "put many more chemists and toxicologists on our payroll or find a way for computer tools to do the job for them," Sorani said.

The job of incorporating key human expertise into a knowledge base took "six months for the first cut," Sorani reported — a surprisingly short time. The expert system was developed on a personal computer using a shell from Aion Corp.

"Probably the biggest technical problem was linking the expert system very tightly" with a DB2 relational database management system containing the basic information about chemicals, Sorani said.

"The beauty of the system" is that whenever information comes in about existing or new materials, it automatically updates relevant files and data sheets and flags Lubrizol's order entry system to update existing sheets "so that customers will always have the most current information about products," Sorani said.

Updates ensure safety

Lubrizol employees throughout the world can get the most recent updates on products' characteristics by accessing the system on-line, Sorani said. This is crucial for ensuring the safety of employees who work with the products, particularly if an accident occurs, he added.

The system also has the ability to monitor and record the series of calculations that go into a material data sheet so that its "thinking" can be checked afterward by a human expert. This was a key feature during the initial testing period, when Lubrizol had its scientists check out every document produced by the system before it was released. Lubrizol "did rigorous testing" of the system's accuracy before trusting its calculations "because of the implications" of the program making a mistake, Sorani said.

The system was completed in 1½ years by an equal number of contractors and in-house staff. It now runs on an IBM 3090 mainframe under MVS at headquarters, on a PC at headquarters to handle the requirements of Lubrizol's Canadian operations and on an IBM Application System/400, with an IBM mainframe providing the database engine, at a European subsidiary.

The envelope, please . . .

The *Computerworld Smithsonian Awards* will be presented to nine groups or individuals deemed to have benefited society through the innovative use of information technology.

The finalists are the following:

Business and Related Services:
- Ambassador College
- Berkeley Systems
- Dragon Systems, Inc.
- Guest Message System, Inc.
- IBM — National Support Center for Persons with Disabilities

Education and Academia:
- Dade County Public Schools
- Electronic Networks for Interaction at Gallaudet University
- Hill View Elementary School
- The JASON Foundation for Education
- Norfolk Public Schools

Environment, Energy and Agriculture:
- Alaska Fire Service, Bureau of Land Management
- Environmental Systems Research Institute
- The National Center for Atmospheric Research
- Unocal Corp.
- U.S. Environmental Protection Agency

Finance, Insurance and Real Estate:
- Bankers Trust Co.
- Corestates Financial Corp.
- Metropolitan Life Insurance Co.
- Swiss Options and Financial Futures Exchange
- The Travelers Corp.

Government and Nonprofit Organizations:
- Australian Capital Territory Magistrate's Court
- Bexar County Criminal District Attorney's Office
- U.S. Department of Commerce
- Eastman Kodak Co., Edicon Systems
- Ministry of Interior/Thailand

Manufacturing:
- Douglas Aircraft Co.
- Ingersoll Milling Machine Co.
- The Lubrizol Corp.
- Westlake Data Corp.
- Wonderware Software Development Corp.

Media, Arts and Entertainment:
- Edgil Associates, Inc.
- National Public Radio
- Personics Corp.
- Televenture, Inc.

Medicine:
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- Purdue University

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- Federal Express Corp.
- Summit Information Systems
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Perot, Tinker honored for achievements

FRAMINGHAM, Mass. — Computer industry entrepreneur H. Ross Perot and Robert Tinker, chief scientific officer at the Technical Education Research Centers (TERC), will be honored with achievement awards in conjunction with this year's *Computerworld Smithsonian Awards.*

Perot, founder of Electronic Data Systems (EDS) and current chairman of Perot Systems, which he founded in 1988 approximately 18 months after leaving the board of directors at EDS acquirer General Motors Corp., is slated to receive the first Lifetime Achievement Award for Information Technology, which is sponsored by Price Waterhouse.

Tinker, who has spent 20 years applying technology to mathematics and science education, will receive the Siemens Award for the Advancement of Science: Laying the Foundation for Science Education, sponsored by Siemens AG.

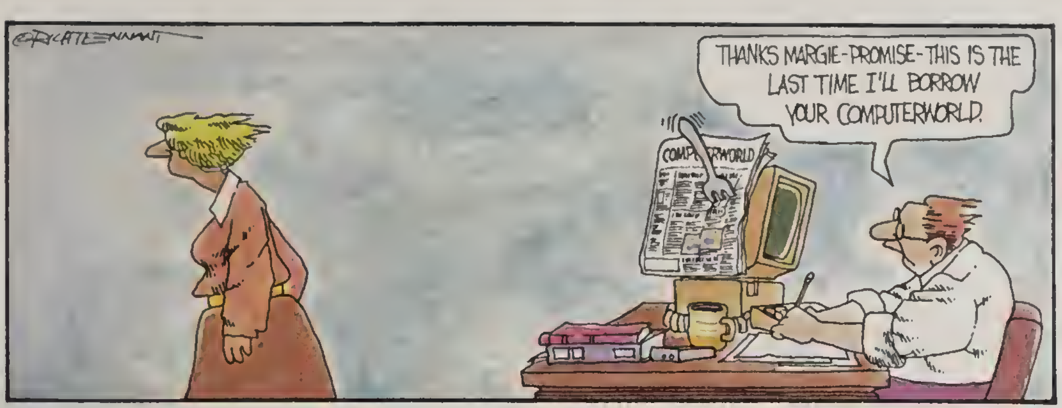
Perot *to receive Lifetime Achievement Award*

Both awards will be presented during the second annual *Computerworld Smithsonian Awards* ceremony on June 25 at the National Building Museum in Washington, D.C.

EDS — founded in 1962 on a $1,000 personal investment, according to popular lore — was a pioneer in the sale of computer services and is the largest organization in the world providing data services to the business and government sector.

Tinker's Cambridge, Mass.-based TERC is credited with bringing technology to the classrooms of more than 75,000 students and 2,500 teachers around the world.

Among the numerous projects Tinker has developed in an effort to enable students, teachers and scientists to share data, observations and findings is the National Geographic Kids Network, which connects classes on a network and focuses scientific curricula on issues such as acid rain.



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   - **23.** Dir./Mgr. Sys. Development, Sys. Architecture
   - **31.** Mgrs., Suprv. of Programming, Software Dev.
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ADVANCED TECHNOLOGY

Multimedia tries to pull itself together

There's a pot of gold at the end of the rainbow, but it's unclear just how long it will take to get there

BY MICHAEL ALEXANDER
CW STAFF

At a recent conference on multimedia in Boston, Carl Machover, president of Machover Associates Corp., a computer graphics consultancy based in White Plains, N.Y., spoke glowingly about the intertwining of audio, video, text, graphics and images on desktop computers. "We're not in Kansas anymore," he said, a reference to the Oz-like wizardry of multimedia.

Machover told the audience of some 75 computer executives that he believed sales of multimedia hardware and software will grow from $400 million in 1989 to $16.9 billion in 1994.

It was no sooner said, however, than Machover revised the latter figure to $2 billion and allowed that $16.9 billion was "a bit optimistic."

Multimedia remains as alluring as a potential gold mine, but many consultants and companies now seem ready to concede that it will be quite a while before anyone strikes it rich.

Several speakers at the three-day 1990 Digital Multimedia Conference sponsored by BIS CAP International, Inc., a market research firm in Norwell, Mass., conceded that there are several significant technical hurdles hindering the broad use of multimedia techniques (see story at right).

Video taxes the computing and storage capabilities of even the most robust of personal computers and workstations, said Sandra Morris, marketing project manager at Intel Corp.'s Princeton Operation in Princeton, N.J.

> "IT IS HARD to convince corporate America of the value of better communication or better animation."
>
> ROBERT BENNETT
> AUTODESK

"Video is so data-rich and data-intensive" that it would take most desktop computers one hour to play back a mere 30 seconds of full-motion video, Morris said. The same 30 seconds of digital video takes up 650M bytes, the entire capacity of a compact disc/read-only memory, she added.

Intel's solution to the processing and storage problem is digital video interactive (DVI), a technology designed to compress and decompress video by as much as 200-to-1 in order to squeeze it through the I/O bottlenecks on desktop computers.

However, images compressed in real time on a desktop computer lack clarity and contrast and are only adequate for applications with a short shelf life or limited distribution, Morris said. The next generation of DVI products will have better performance, she added.

Agnes Aru

Yet another problem is that there are no video compression standards. Two international standards groups are currently working on standards for still-video and full-motion video images, but it is uncertain when they will be completed or whether the two will be interrelated.

Intel is touting DVI, which is supported by such firms as IBM and Microsoft Corp., as a standard essentially because it operates under MS-DOS. The company plans to introduce DVI systems for Unix and Apple Computer, Inc.'s Macintosh as well, Morris said.

Apple, which supports the proposed international standard for full-motion video, "will never do a DVI product," said Doug Camplejohn, product manager of media integration products. "We [at Apple] don't believe that the hardware is flexible enough to meet our needs."

DVI is a compression technology aimed solely at the PC industry, according to Camplejohn. "The problem of passing video is critically important to telecommunications and consumer electronics companies. Along with the PC industry, they will also drive video compression standards."

Computer animation, still another significant piece of the multimedia puzzle, lags behind developments in audio, video and other aspects of multimedia production. It, too, is hindered by the lack of a compression standard.

Animation, like video, consumes massive amounts of memory and storage space and is thus of limited use. "A Tower of Babel in formats" makes it difficult, if not impossible, to shuttle computer animation between platforms, said Robert Bennett, multimedia group product manager for Autodesk, Inc.

The quality of computer animation is also less than what many people would expect. Character animation, the animation of human faces, is still several years off. Frame-by-frame animation, which yields the highest quality, takes several days of nonstop computing to generate. Real-time animation is faster and useful for a wide variety of applications, such as business presentations, but can often seem crude in comparison.

"It is hard to convince corporate America of the value of better communication or better animation," Bennett conceded.

Authoring, the writing of scripts and creation of multimedia productions, is time-consuming and beyond the skills of educators, trainers and other professionals who would most likely be charged with creating corporate productions.

"Authoring is not easy, period," said Joseph Fantuzzi, vice-president of marketing at Authorware, a publisher of multimedia authoring programs based in Minneapolis. Fantuzzi predicted that multimedia will follow a learning curve similar to that of desktop publishing.

As there is today a "desktop publisher," there will eventually be a "multimedia author" who understands how to blend multimedia content and structure, Fantuzzi said.

Two ways to look at it

The demands of mixing sights, sounds and software on a personal computer or workstation will lead manufacturers to develop desktop computer systems designed for multimedia applications, several speakers predicted at BIS CAP International, Inc.'s conference recently.

"We believe that the convergence of computers and video is the future," said Lawrence Kaplan, vice-president and general manager of the visual systems group at Tektronix, Inc. He said two sorts of desktop computer systems are likely to develop: a multimedia PC and a visualization workstation. The two will be distinguished by the applications each will be designed to run. For example, a multimedia PC will run applications for education, entertainment and training. A visualization workstation, however, will have more computing horsepower and will be intended for "visually-intensive applications" such as large-scale mapping; combining data-rich sources such as satellite imaging and elevation data; and high-quality prepress production work, Kaplan said.

Virtually every manufacturer has announced plans to introduce a PC designed expressly for multimedia applications, according to David Archambault, director of business markets at Commodore Business Machines, Inc. Commodore is touting its new Amiga 3000 PC and its Amigavision authoring system for multimedia applications. The computer has capabilities such as multitasking, real-time animation and four-voice stereo audio.

MICHAEL ALEXANDER

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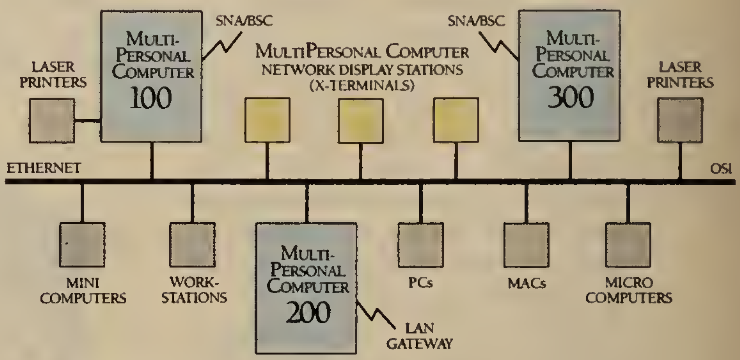
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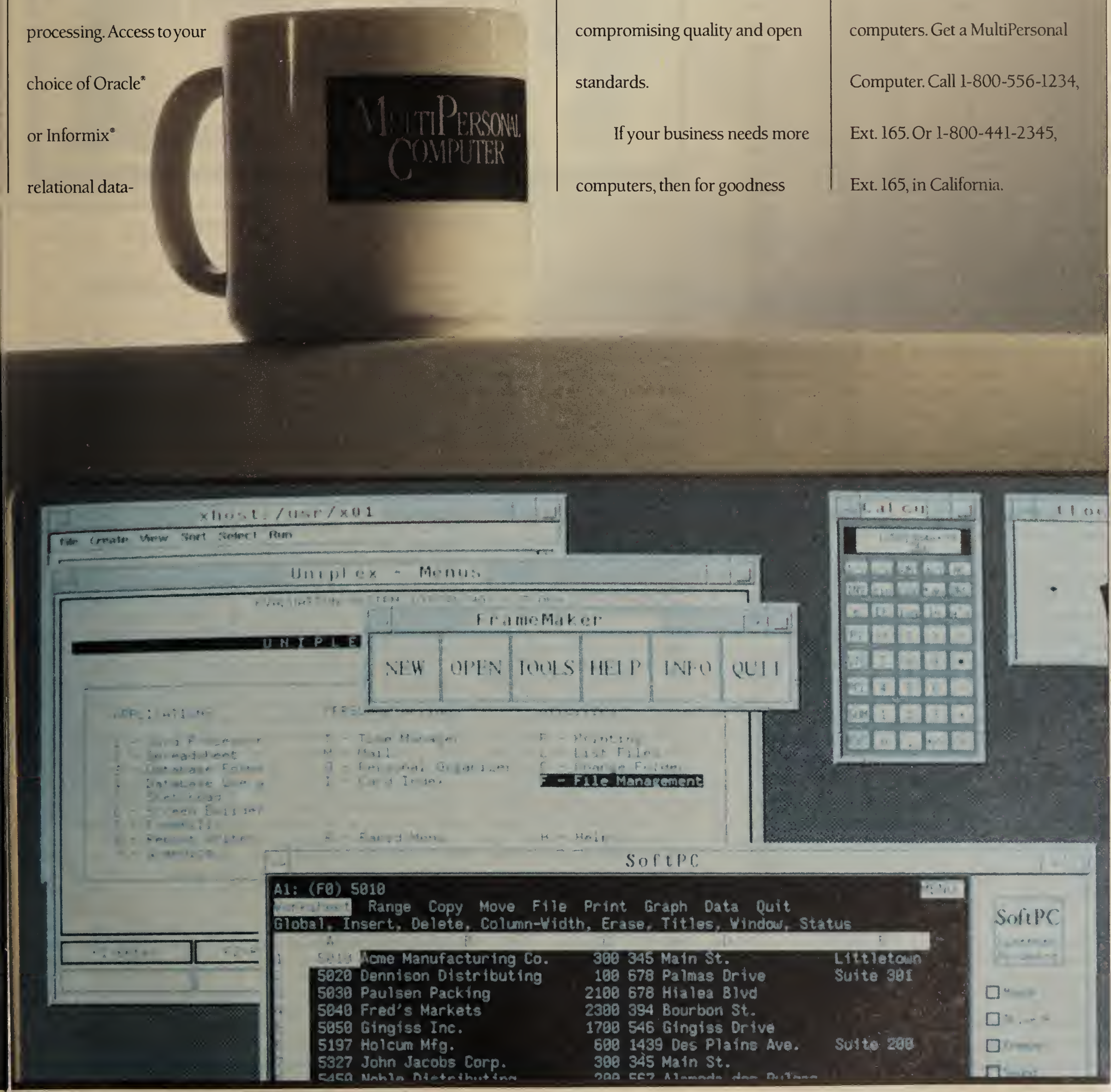

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EDITORIAL

Talk is cheap

IN THE MIDDLE of the terribly hot summer of 1988, a high-level Soviet technology delegation toured our offices. They were politely and predictably impressed with our Macintosh graphics capabilities (and blatantly unimpressed with our text system, claiming that *Pravda* has a far more sophisticated system).

But over coffee and countless cigarettes after the tour, the group delivered a pointed message: If you Americans are really interested in better relations with the Soviet Union, then make more of your computer equipment available to us. And by the way, we don't have much hard currency to pay for it.

Last week at the seventh World Computing Services Industry Congress in Washington, D.C., both Luanne James of Adapso and Philippe Dreyfus, vice-chairman of CAP Gemini, delivered messages designed to provoke the vendor attendees toward greater social responsibility as world citizens. Doing so would ultimately serve their self-interests, the two said.

Also last week, Soviet President Mikhail Gorbachev, along with an official of the Soviet Academy of Sciences, toured computer companies in Minnesota and California. The Academy official echoed a message we'd heard earlier: The Soviet Union is in desperate need of U.S. computer technology and equipment. We just don't have much money to pay for it right now. (By the way, estimates of Soviet gold reserves — gold's a very nice hard currency — are immense.)

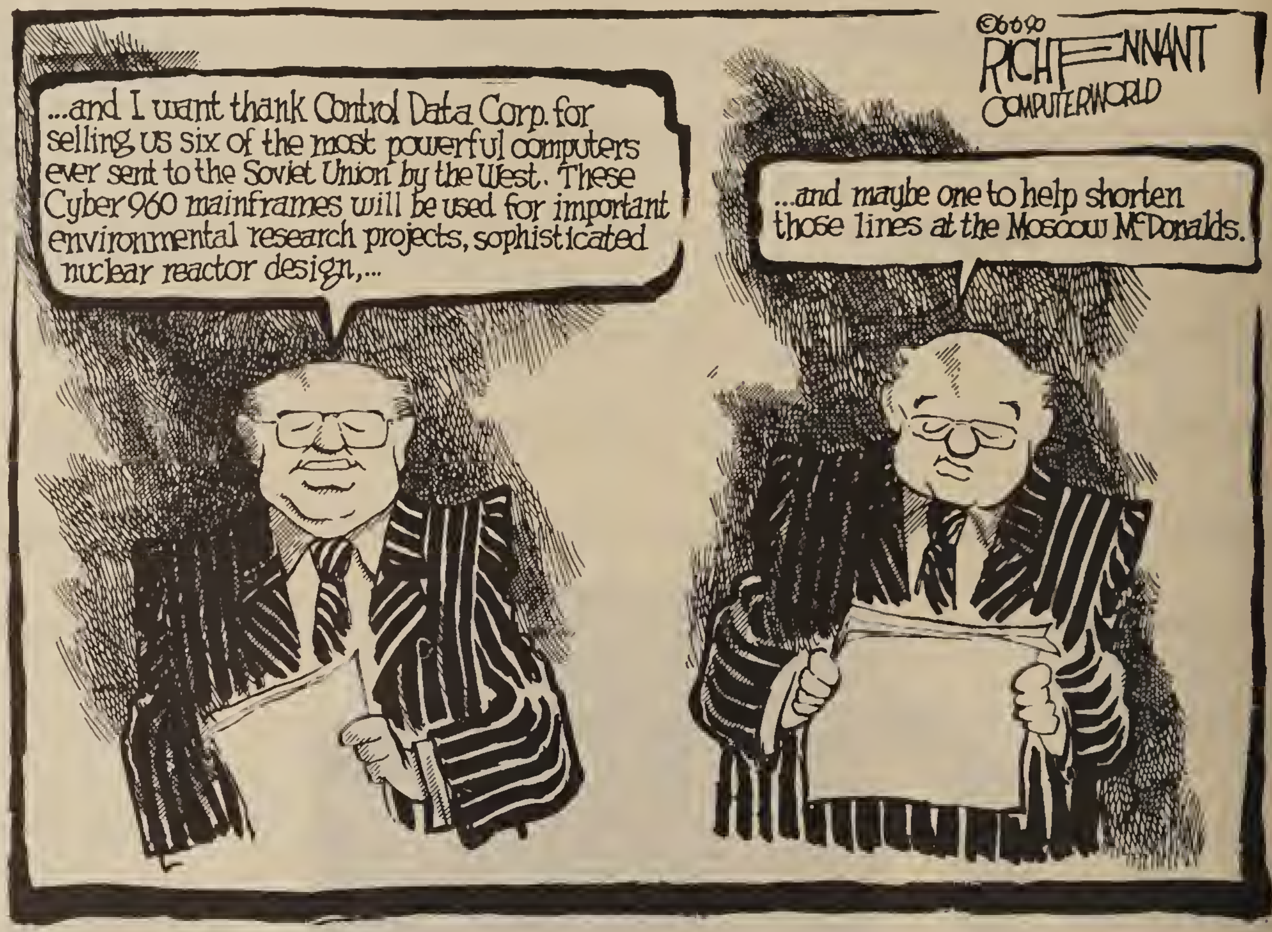
How desperate are the Soviets for computer equipment? According to newsletter author Esther Dyson, who has spent a lot of time behind that rusty old curtain, personal computers are selling in Moscow for as much as 100,000 rubles (a ruble is worth about $1.70, if it can be converted at all), and a copy of Nantucket's Clipper PC database software sells for 6,000 rubles.

With the ruble basically worthless as a trading medium and the Soviet government very tightfisted with whatever hard currency it holds, just what are the Soviets asking for here? Is it the milk of human kindness alluded to at the World Congress? This and 85 cents will get them a ride on Washington's Metro but not much more.

U.S. and foreign companies are more than willing to invest in the Soviet market as well as other markets. But with the relative progress toward free markets being made in the Soviet Union vs. the progress in Eastern Europe, the Soviet market looks like a much higher risk for investment funds (with an arguably greater potential for reward).

What the Soviets can provide, as their academy official noted, is fairly sophisticated programming services. This has universal marketability to which a value (translatable into computer equipment) can be affixed. Unfortunately, Soviet laws can make even simple labor-for-goods exchanges difficult and hardly worth the effort.

The U.S. government is moving steadily toward easing trade restrictions with the Soviets. It's time to see some greater due diligence from them as well.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...and maybe one to help shorten those lines at the Moscow McDonalds.
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LETTERS TO THE EDITOR

That's cool

Your Advanced Technology article, "Superconductor firms stay cool" [CW, April 30], was a well-written and comprehensible assessment of some of the problems connected with the development of commercially feasible superconducting computing circuitry. However, I was quoted somewhat out of context and would like to clarify that point.

I am quoted as saying about Conductus that we have "no products and no timetable for them." As the article correctly points out, we have research going on in the computing area, and we believe we are several years away from having any computing products. Conductus does, however, have a number of other products, not based on Josephson junction technology, both on the market and in prototype.

We are currently selling several pieces of process equipment, and we have in prototype a bolometer product for infrared and microwave sensing, which is made from high temperature superconducting material; a SQUID magnetic field sensor fabricated from high-temperature superconducting materials; and several types of interconnect and microwave components.

In digital electronics, we are operating a niobium process facility to fabricate low-temperature superconducting circuits to the design of another company and are just starting a program (with federal funding assistance) to design and simulate a niobium nitride shift register circuit.

We will have at least two of our superconducting products in beta testing by the end of this year and are currently generating revenue from the sale of process equipment and superconducting thin films to other development laboratories.

Ora E. Smith
Vice-President and Chief Marketing Officer
Conductus
Sunnyvale, Calif.

Up with Amiga

It would be nice if the computer press would pay more attention to the Commodore Amiga computers. They are rather sophisticated, but *Computerworld* seems to look the other way most of the time. Why is this? Please open your mind some more, and when you do a report on this computer, at least give it more than a few words.

The new Amiga 3000 personal computer comes standard with 2M bytes of random-access memory, not 1M as was reported in "Making it multimedia" [CW, April 30]. The hard drive is small computer systems interface (SCSI). It is also packaged with Amigavision software for easy multimedia presentations.

It's also a true 32-bit micro: It does 32-bit I/O to standard SCSI hard drives. It has eight custom coprocessor chips on the motherboard to take a load off the Motorola 68030 microprocessor, handling I/O, graphics, animation, sound, RAM, etc., thus making it much faster than "25 MHz" would indicate (faster than an Apple Macintosh IIFX at one-third the cost).

It is also MS-DOS compatible with the simple addition of a card, can share a hard drive between MS-DOS and Amiga-DOS and can directly address 1G byte of memory. With additional software, it can run Mac software.

George M. Knochel
Lakewood, Colo.

CASE-specific

Your article on the delayed acceptance of OS/2 [CW, April 30] correctly notes that several niche applications are now taking advantage of its expanded capabilities. One niche that wasn't mentioned is computer-aided software engineering (CASE) tools. With OS/2-based CASE tools, developers gain power and flexibility over DOS-based tools.

For example, more memory means users can open planning, analysis, design and construction tools concurrently in multiple windows. Also, they can create and manipulate far more objects in their diagrams. Thanks to multitasking, users aren't put on hold while their computer is generating code, compiling or printing; they can continue working in another window, even on non-CASE software.

With Presentation Manager, the readability of text and icons is vastly improved. Unlike DOS-based tools, the new OS/2-based CASE tools can be enhanced infinitely with new features and functions.

While OS/2 may be catching on slowly for general-purpose use, there are specific applications where its capabilities are quite important.

Donald P. Addington
Executive Vice-President
Knowledgeware, Inc.
Atlanta

Computerworld *welcomes comments from its readers. Letters may be edited for brevity and clarity and should be addressed to Bill Laberis, Editor,* Computerworld, *P.O. Box 9171, 375 Cochituate Road, Framingham, Mass. 01701. Fax: (508) 875-8931; MCI Mail: COMPUTERWORLD.*

Revolution breeds impatience

CLINTON WILDER

It is by no means venturing into hyperbole to say that the information systems profession is in the throes of revolutionary change.

For example, in the same month that Max Hopper publishes an article in *Harvard Business Review* on information strategies, the president of the Association for Systems Management warns that the association risks its very existence if it doesn't wise up to business issues. One is hard-pressed to imagine any function in the history of business that has evolved from birth to back-office support to competitive differentiator in the span of 30 years.

Today's IS executive faces unprecedented demands — and unparalleled opportunities. For the cream of the crop, the rewards are high six-figure salaries, executive committee seats and the chance to truly shape corporate strategy. The idea of the IS executive as corporate hero, a concept that *Computerworld* strongly supports, is very real. But it's a staggering thought when you remember the glass house era of the not-so-distant past.

All these new demands and prestige, however, have caused unprecedented upheaval and impatience — impatience that I fear could erode the edge that effective IS gives U.S. companies in global competition.

Firings, resignations, reorganization victims and ship-jumpers currently liven the headlines of this and other IS publications. The high IS turnover rates even led *Business Week* to conclude in a recent story that CIO might as well stand for "career is over."

What that witticism fails to grasp is how much of the turnover is because of ambitious (and frustrated) IS executives moving on to bigger and better things. The recent cross-country moves of Mike Heschel from Baxter International to Security Pacific and Mike Simmons from Bankamerica to Bank of Boston are just two examples. "Career is opportunity" is more like it.

Considering the new dynamics of IS' relationship with business management, the high turnover rates should come as no surprise. It's hard to find companies — the Citicorps, Federal Expresses and Xeroxes — where the chief executive officer's enlightenment level about technology is in sync with the chief information officer's level of business savvy.

More often, a progressive CIO chafes against a short-term, computers-are-too-damn-expensive view from business management. On the other hand, an enlightened CEO can be saddled with an IS chief who is dazzled by I/O channel speeds and new programming techniques, without having a clue or care about global competition. In either of these situations, the IS chief is eventually going to leave.

In the U.S., we see nothing wrong with that. If things aren't working out for you at your current employer, you update your resume and call your favorite headhunter. That's being ambitious, motivated and self-actualizing. No one wants to return to the days when you simply honed your tech skills, worked your way up from programmer to analyst to project leader to manager and never left the data center — let alone the company.

The IS executive of the 1990s, however, is responsible for establishing, along with business management, a long-term vision of where the company should go with technology. The hardest work of all is the constant push for change.

Change can be enabled by information technology, but it is a slow, painful process. When IS executives tell their success stories, they are replete with false starts and delays. For instance, the plant manager championing the new resource planning system left the company. A hostile takeover defense put the clamps on spending. The system was not powerful enough, and we had to start over. Given these hurdles, a five-year window for IS-enabled transformation is not uncommon.

Eighty-five percent of CEOs surveyed by *Computerworld* last year said that IS holds the key to competitive advantage in the 1990s. Yet one of the major factors behind our lagging competitive posture with Japan is our preoccupation with short-term goals and gains. With its newfound stature among the corporate elite, is the IS profession starting to fall victim to these same unstable facts of U.S. business life?

Two colleagues and I recently spent a week in Japan interviewing Japanese managers about their firms' use of IS. The legendary company loyalty of Japanese employees who sing corporate songs is something we find extreme, but there are lessons to be learned from IS managers who take the long-term view.

Those lessons are particularly applicable to IS, where major projects, and especially an overall technology plan, take a lot of time. I'm not suggesting that all IS executives adopt Japanese lifetime employment as a way of life. But IS leaders with a strong vision of their firms' technology future must stay around long enough to implement that vision.

Before IS executives use their new wings of full-fledged business executives to fly off to greener corporate pastures, they should think about the potential long-term impact on U.S. competitiveness.

Wilder is *Computerworld*'s senior editor, management.

DEC takes cue from industry and reshapes internal parts

STEPHEN SMITH

As we enter the 1990s, does DEC still have it?

The press has been virtually unanimous in writing DEC off as a fading minicomputer company. It is not surprising, therefore, that there is some serious self-examination under way in Maynard, Mass. I recently spent half a day there meeting with top DEC management and attended a subsequent two-day financial/industry analysts briefing. What I learned may surprise you.

It starts at the top. For years, we have speculated on the eventual successor to Ken Olsen. Now it's pretty clear. Jack Smith, head of engineering and manufacturing since 1986, was recently appointed senior vice-president of operations. With the resulting addition of DEC's worldwide direct and indirect sales and service organization, most of DEC now reports to Smith. It's only a matter of time before Smith is appointed chief operating officer. Not that Olsen is stepping down — far from it. But it was clear from our meetings that Olsen has begun to delegate more and more responsibility to Smith. As a result, some big changes are under way.

Smith told me that his No. 1 goal is to improve profitability, and Olsen told me that DEC will soon pay a dividend. What does this mean to you, the customer? Higher prices? Less support? No, the changes have to come in other areas. Why the new focus on profitability? DEC has finally awakened to the fact that nothing hurts it more than the impact of negative articles in the press about its key decision makers.

DEC's biggest problem is that it has too many employees. Revenue per employee, a clear measure of the efficiency of a company in just about any industry, has now fallen behind that of its competitors.

Another big loser from DEC's massive wave of hiring is its own employees. Eliminating excess jobs and weeding out underperformers is clearly in the best interest of the majority. Smith made it clear: "Jobs will be eliminated" as part of the major changes under way at DEC.

DEC recently reorganized itself into 15 business units, each with profit responsibility. It hopes to improve the focus and performance of the new business units without resorting to the morale-destroying cutbacks seen elsewhere along Rt. 128.

Smith indicated that big changes are also ahead for DEC's sales force. The days of straight salary are over. Whether DEC will eventually go all the way to the aggressive base-plus-commission schemes used by many of its competitors is not yet clear, but some form of sales incentive program is under active consideration. If there is one consistent theme that I hear from DEC's customers, it is criticism over the lack of responsiveness from its sales force. It has been all too easy for a salesman to sell a large customer another VAX. But Scott McNealy, head of Sun Microsystems, recently expressed surprise to me that DEC salesmen weren't doing a better job with DEC's new line of competitive reduced instruction set computing workstations.

What about the product strategy? You might be surprised to learn that DEC is spending more on research and development for Unix than for VMS! But DEC's vision goes way beyond the issue of Unix vs. proprietary operating systems such as VMS in the future.

DEC's message in the 1980s was simple — VMS, one single architecture from desktop to mainframe. It worked well.

DEC's strategy for the 1990s is to provide a single architecture from desktop to mainframe, but one that will span a wide range of hardware from many different vendors.

Unlike IBM's Systems Application Architecture (SAA), DEC's Network Applications Support (NAS) is an "open" architecture. It is based on Decnet and Transmission Control Protocol/Internet Protocol but is evolving to industry-standard Open Systems Interconnect. Although it's still a well-kept secret, many of the pieces are already in place, and NAS is beginning to attract attention from industry consultants.

IBM's rigid focus on SAA as an IBM-only solution creates another major opportunity for DEC to gain further market share at IBM's expense, as it did with VMS in the 1980s. Why is NAS such a well-kept secret? The answer lies in DEC's virtually complete lack of presence in the personal computer industry and in the increasingly important retail distribution channel. DEC totally lacks a practical solution for the small user wishing to expand his PC network.

Recognizing that this hole exists, DEC may be planning another foray into the retail channel soon. Let's hope it's better than the last attempt. The changes under way at DEC are good news for its customers, employees and shareholders. However, unless DEC can rapidly fill its glaring hole in the retail channel, it may be left looking inward to the needs of its existing base rather than addressing the vast scope of new opportunities opened up by NAS.

Smith is first vice-president of research at Paine Webber, Inc. in New York.

The way Washington State University runs its

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Universities and corporations have a lot more in common than one might guess.

Both, for example, have a board of directors, senior management and other professionals whose success depends on accurate, timely information. Both also have a number of separate administrative functions that need to be skillfully managed.

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SYSTEMS & SOFTWARE

SOFT TALK

Rosemary Hamilton

Run it by us once again?

Doesn't it figure: AD/Cycle is one of the most critical and far-reaching proposals IBM has ever made to users, and yet the company often has trouble explaining it.

If IBM expects users to make such a huge (and expensive) commitment to this application development environment, it needs to do a better job telling users what it is.

Recently, even Earl Wheeler, IBM vice-president and general manager of systems programming, acknowledged this. He said he was aware of an industry perception of AD/Cycle that pegged it as little more than a concept.

"The perception that's out there is because we may not have done a good enough job of communicating what we're trying to do," Wheeler said. "Some of it may be out there because people don't want us to communicate what we are trying to do."

I agree with the first point, but the second just doesn't cut it. If people don't understand AD/Cycle, it's not because anti-IBMers are out there spreading misinformation. There's always some misinformation floating around any big IBM product. Users tend to be smart enough to put that into perspective — if they have facts from IBM with which they can compare the misinformation. If there's a

Continued on page 33

Computer cop stakes out OTC trading

NASD seeks to restore lost confidence in securities trading with electronic surveillance system

ON SITE

BY GARY H. ANTHES
CW STAFF

ROCKVILLE, Md. — A computer model just installed at the National Association of Securities Dealers, Inc. (NASD) was suspicious one day this past January, so it sounded an alarm. A news story had come across the wire saying a company was to receive a major infusion of capital, and the price of the firm's stock jumped almost 100%.

However, what triggered the model was suspicious price and volume data that occurred before the news release. Supported by a host of automated tools, a NASD analyst alerted by the model later discovered that the brother-in-law of the firm's chief financial officer and the cousin of the chairman bought 62,000 shares of the company's stock the day before the announcement. The case is now being investigated by the U.S. Securities and Exchange Commission.

NASD calls its new market surveillance system an electronic conscience, but it is really more of a computerized cop. "The objective is to catch the crooks out there," explained Jack Samarias, information systems vice-president.

In 1978, NASDAQ — the market for over-the-counter stocks operated and regulated by NASD — accounted for 26% of trading in the three primary U.S. markets. By 1989, it had jumped to 43%, while annual volume rose from 3.7 billion to 33.5 billion shares.

However, as volume soared, investor confidence in securities markets plunged, battered by Wall Street scandals and the Black Monday crash of 1987. Those forces led NASD to seek a more sophisticated way of ensuring that its member dealer firms and listed companies remain squeaky clean.

Now, a group at NASD's Rockville facility is fine-tuning a sophisticated system conceived by two professors from Pennsylvania State University with help from two Nobel laureates at MIT. It is a statistical model with expert system-like parameters that adjust with experience, according to John DeSaix, requirements director at the NASD Information Systems Department.

SWAT alert

SWAT, for Stock Watch Automated Tracking, monitors in real time 150,000 trades and 40,000 price quotes generated daily around the country and fed to Rockville through NASD's data center in Trumbull, Conn. The SWAT model knows the historical trading patterns of the 4,265 NASDAQ companies. If indicators such as volume, price or quote spread cannot be explained by the model in terms of legitimate market forces, the model triggers an alert, telling a NASD analyst there may be reason to halt trading in the stock while looking for improper activity such as insider trading.

Each day, the model issues some 80 to 90 alerts, or "breaks" as NASD calls them, because they break historical parameters in the model.

On a busy day, alerts may queue up on the screens of the five analysts in NASD's Stock Watch section, but the model assigns them priorities based on its view of how suspicious price or trading activity is.

The analysts also consider news stories fed to their workstations by a new subsystem that scans four commercial wire services for the ticker symbols of NASDAQ companies. Relevant news stories are automatically downloaded to a database from which analysts can retrieve current and past stories or headlines by company symbol.

NASD's *Stock Watch Automated Tracking system monitors 150,000 trades and 40,000 price quotes daily in real time*

Timing is critical. A sharp price movement after a public announcement might not trigger an alert, while a similar movement before the announcement almost surely would.

Automation of the news feeds has reduced response time considerably, said Frank Knox, director of market surveillance. With an earlier system, someone had to read all the paper wire copy, cut out relevant pieces and hand-deliver them to the analysts. Recently, Knox said, a stock was trading at $14 per share when news of a takeover bid at $21 came over the wire. The SWAT analyst saw the item in a window of his workstation and halted trading in the company's shares within 45 seconds of the news item's release.

In another improvement, NASD has brought together most surveillance information into multiple windows of the analysts' Sun Microsystems, Inc. workstations. Previously, analysts had to go to multiple automated and manual systems to compile information. Now they can see alerts, news, current activity, historical patterns, details of past trades, the names of each stock's trading specialist, information on member firms and other information on one screen.

The SWAT model and other surveillance systems run on a dedicated fault-tolerant computer from Tandem Computers, Inc. SWAT, on which NASD has spent more than $1 million in the past two years, runs continuously, as a real-time system, processing interrupts from the NASDAQ trading system and from the news subsystem.

SWAT replaced a 13-year-old system with no automated news input and no reference to historic trading patterns for individual stocks. The old system also failed to consider overall market movement in deciding whether individual price fluctuations were suspicious.

"Users who need connectivity software for remote access...should investigate MUST Software's NOMAD."—Richard Finkelstein, DBMS, 11/89

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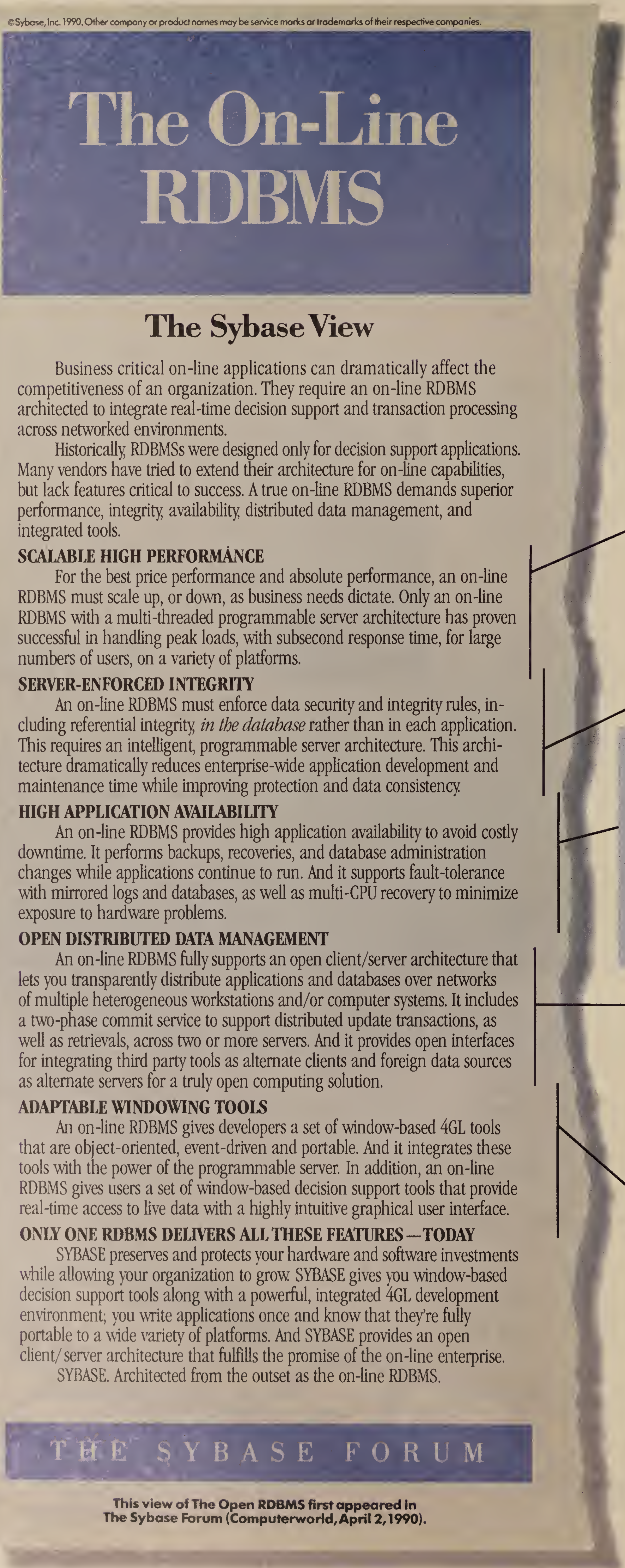

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The On-Line RDBMS

The Sybase View

Business critical on-line applications can dramatically affect the competitiveness of an organization. They require an on-line RDBMS architected to integrate real-time decision support and transaction processing across networked environments.

Historically, RDBMSs were designed only for decision support applications. Many vendors have tried to extend their architecture for on-line capabilities, but lack features critical to success. A true on-line RDBMS demands superior performance, integrity, availability, distributed data management, and integrated tools.

SCALABLE HIGH PERFORMANCE

For the best price performance and absolute performance, an on-line RDBMS must scale up, or down, as business needs dictate. Only an on-line RDBMS with a multi-threaded programmable server architecture has proven successful in handling peak loads, with subsecond response time, for large numbers of users, on a variety of platforms.

SERVER-ENFORCED INTEGRITY

An on-line RDBMS must enforce data security and integrity rules, including referential integrity, *in the database* rather than in each application. This requires an intelligent, programmable server architecture. This architecture dramatically reduces enterprise-wide application development and maintenance time while improving protection and data consistency.

HIGH APPLICATION AVAILABILITY

An on-line RDBMS provides high application availability to avoid costly downtime. It performs backups, recoveries, and database administration changes while applications continue to run. And it supports fault-tolerance with mirrored logs and databases, as well as multi-CPU recovery to minimize exposure to hardware problems.

OPEN DISTRIBUTED DATA MANAGEMENT

An on-line RDBMS fully supports an open client/server architecture that lets you transparently distribute applications and databases over networks of multiple heterogeneous workstations and/or computer systems. It includes a two-phase commit service to support distributed update transactions, as well as retrievals, across two or more servers. And it provides open interfaces for integrating third party tools as alternate clients and foreign data sources as alternate servers for a truly open computing solution.

ADAPTABLE WINDOWING TOOLS

An on-line RDBMS gives developers a set of window-based 4GL tools that are object-oriented, event-driven and portable. And it integrates these tools with the power of the programmable server. In addition, an on-line RDBMS gives users a set of window-based decision support tools that provide real-time access to live data with a highly intuitive graphical user interface.

ONLY ONE RDBMS DELIVERS ALL THESE FEATURES—TODAY

SYBASE preserves and protects your hardware and software investments while allowing your organization to grow. SYBASE gives you window-based decision support tools along with a powerful, integrated 4GL development environment; you write applications once and know that they're fully portable to a wide variety of platforms. And SYBASE provides an open client/server architecture that fulfills the promise of the on-line enterprise.

SYBASE. Architected from the outset as the on-line RDBMS.

THE SYBASE FORUM

This view of The Open RDBMS first appeared in The Sybase Forum (Computerworld, April 2, 1990).

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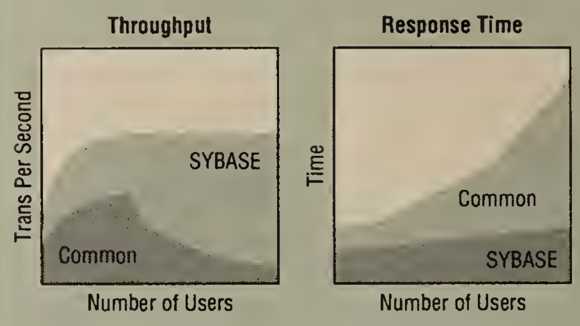
SYBASE SQL Server® delivers the high throughput and fast response times needed for on-line applications. Moreover, SQL Server maintains performance levels as the number of users and the size of the databases grow.

SYBASE performance is based, in part, on a multi-threaded server architecture that includes its own kernel and SQL task manager that are optimized to handle multi-user functions usually associated with the operating system. In addition, the SYBASE SQL Server architecture

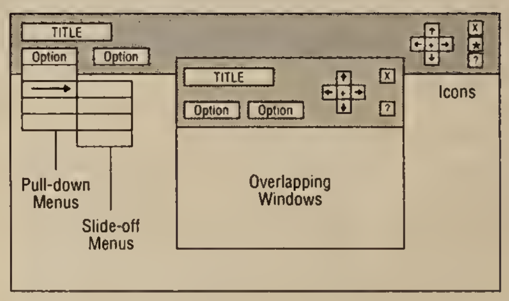


SYBASE maintains maximum transaction throughput and fast response times over an extended range of users.

The on-line enterprise cannot afford an RDBMS that must periodically be taken off-line for routine maintenance activities, such as database backups, diagnostics, design, and integrity changes.

SYBASE SQL Server allows all such activities to be handled on-line, with system-supplied stored procedures, while applications continue to run.

SQL Server also protects against hardware problems by supporting *software-based* fault tolerance with mirrored logs and databases, as well as multi-CPU recovery.



SYBASE provides a highly intuitive graphical user interface to maximize productivity for developers and end-users alike.

SYBASE boosts productivity with powerful window-based tools that meet the needs of all users. Programmers get a state-of-the-art fourth generation language (4GL) programming environment. Overlapping windows, pull-down and slide-off menus, and icons help developers build complex, on-line applications in a fraction of the time it takes using traditional tools.

In addition, SYBASE offers a complete SQL life-cycle toolset for developers. All phases are supported, including design, prototyping, development, testing, administration, and maintenance.

ke To Add Some tive To Our View Of n-Line RDBMS.

has been extended to take full advantage of symmetrical multiprocessor (SMP) hardware systems. The resulting benefits are greater throughput, more effective load balancing, extended multi-user capacity, and efficient operational control.

In Computerworld (March 5, 1990, "Buyer's Scorecard") SYBASE ranked first in eight out of eighteen categories, including "Performance in processing on-line transactions" and "Performance in decision-support applications."

One of New York's most respected investment research and management companies, Sanford C. Bernstein & Co., chose SYBASE because "Of all the systems we evaluated, SYBASE was clearly the fastest. It accommodated multiple users without losing performance and offered the most functionality both on the transaction processing end and the data management end."

The on-line enterprise demands data and application integration and interoperability in a multi-vendor environment — *SYBASE Open Client/Server Architecture provides exactly that.*

SYBASE Open Client permits the use of a variety of front-end tools or applications, including SYBASE applications, independent software vendor's tools, and user written applications. SYBASE Open Server can seamlessly integrate hierarchical and relational DBMSs, third-party applications and real-time data feeds into SYBASE applications.

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INFO WORLD

FROM THE TEST CENTER

Dueling Servers

See Page 57

MARCH 5, 1990 THE WEEKLY FOR PERSONAL COMPUTING PROFESSIONALS VOLUME 12, ISSUE 10

This is what InfoWorld (March 5, 1990, "Dueling Servers") had to say about SQL Server's referential integrity: "The more power a multiuser relational database system has, the more potential there is for disaster. If you change a number on one table, any other table that depends on it may need to be changed. The risk lies in the failure to update all the appropriate related tables. The likelihood of this increases even more as more front-end applications that access the same data are added to the system.

"SQL Server offers effective countermethods. Its triggers, a type of stored procedure that executes whenever a given condition occurs, are attached physically to a table…and check all updates, inserts, or deletions for their effect on related tables. Since the trigger is installed at the server level — and not run through the front-end application — it doesn't matter which application updates the critical table. This is a critical feature as front ends multiply, and the potential for mismanaging data is increased. And since a given trigger need only be written once, at the server, it makes data integrity programming easy."

A final note: InfoWorld rated SQL Server referential integrity "excellent."

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Not the end of the line for PDPs

ANALYSIS

BY MARYFRAN JOHNSON
CW STAFF

Just when everyone had written off Digital Equipment Corp.'s 20-year-old PDP minicomputers as old workhorses destined for computer pastures, out trotted two new models last month with a 40% power boost and a compact new chip set.

Competition for its frisky offspring, the VAX line? Not exactly.

Industry analysts are dismissing the new PDP-11/93 and 11/94 — available this summer at base prices of $14,175 and $21,420, respectively — as little more than an "end-of-life kicker" for the line that sent DEC's fortunes soaring in the 1970s. Today, it lives on through the dogged loyalty of some users and the reluctant tolerance of others.

While analysts have been burying the PDP since the 1977 debut of the VAX line, it keeps rearing up and contributing an estimated $1 billion annually to DEC's bottom line. In 1989, the PDP still accounted for 9.5% of DEC's sales revenue, according to Cupertino, Calif.-based market research firm Infocorp.

Of the 600,000 PDPs sold since 1970 (a figure that includes board-level products as well as complete systems), there are still at least 177,000 machines installed and working, Infocorp figures showed.

"Every once in a while there's a classic, and the PDP-11 happened to be one of them," said Terry Shannon, an analyst at International Data Corp. in Framingham, Mass. While DEC has tried to entice PDP users over to the Microvax line, keeping its installed base happy has been a key concern, he noted.

Old faithful

While there is a certain amount of inbred loyalty among PDP customers — particularly among real-time users enamored of the RT-11 operating system — it is often a particular software package in the massive library of PDP applications that keeps a user company faithful to the old machine.

Gregory Verbosky, data center manager at the University of California Medical Center in Irvine, said his shop will keep its two PDP-11/84s because the software vendor for the medical center's materials management and accounts payable system requires a PDP platform.

The new PDP models are probably aimed at government clients who also want to spin out their technology investment, Verbosky said.

"A lot of big government contracts have all their software written for the PDPs," he said.

At the U.S. Veterans Administration Hospitals, which were once coast-to-coast strongholds for PDP systems, the larger medical centers are moving to VAX 6000 systems these days. However, the VA is hanging onto its PDPs by passing them along to the smaller hospitals, said Thomas Tierney, acting chief of information resources for the VA in Grand Island, Neb.

"We're looking at the literature now on the new PDPs," said Tierney, who runs medical data processing applications on two PDP-11s and is about to install two more.

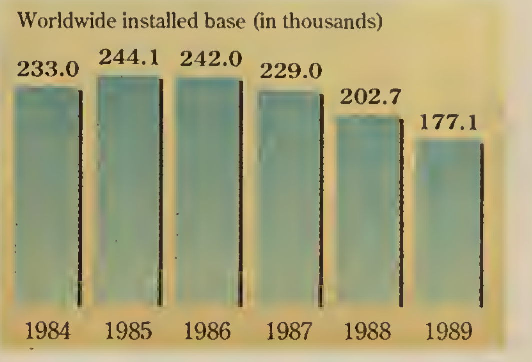
"Down the road, we may be upgrading, but I'm not sure DEC is committed to continuing the line," he added. "I think they came out with these new models just to keep users of current PDPs from leaving."

One user who is regretfully leaving the line behind is Rheem Manufacturing Co. in Fort Smith, Ark. "It's a good machine, but it's outdated," said Ron Schrodt, vice-president of materials and information systems. The heating and air-conditioning division of Rheem uses a PDP-11 for specialized data collection in its factory.

As the company moves on to networked personal computers, the PDPs "don't seem to fit in very well with our networking plans," Schrodt explained. "But it's probably worth checking out these new ones. We love the application running on the PDPs now; we just can't get data in and out the way we'd like."

Shrinking giant

DEC's installed base of PDP-11 minicomputers may be getting smaller, but it still totals more than 177,000 machines worldwide



Source: Infocorp CW Chart: Paul Mock

Beyond its substantial installed base, DEC is also eyeing the emerging market in Eastern Europe as a likely place to peddle PDP-11s, a DEC spokesman said last week.

The new MicroPDP models differ mainly in their bus technology. The Model 93 is a Q-bus system, while the Model 94 is a Unibus system, meaning that each supports different peripheral devices compatible with those buses. Both models can be installed as board-level field upgrades for MicroPDP-11s and PDP-11/84s.

Historically, the PDPs made their mark as the most vanilla, general-purpose computers anywhere. The famous Times Square message sign is powered by a PDP-11 system, as are the stage lights in La Scala Opera House in Milan, Italy, and the audiovisual displays at the Smithsonian Institution's Air and Space Museum in Washington, D.C. Ford Motor Co. still uses PDPs to weigh vehicles coming off the production line.

All told, some 350 companies still make their living selling PDP peripherals and software, according to Dom LaCava, vice-president of low-end systems at DEC. At a gathering of DEC users last month, LaCava said his company's commitment to the PDP line should send them a reassuring message about the future of VAX/VMS as well.

"Commitment?" snorted one user listening to LaCava's speech. "He means market demand. As long as people keep buying them, DEC will keep making them."

IBM's AD/Cycle: Concept vs. reality

While one level exists today, it will take years to migrate to the second

BY ROSEMARY HAMILTON
CW STAFF

IBM and two of its business partners recently went on the offensive to challenge the industry perception that AD/Cycle is more concept than reality.

However, this trio, which included Bachman Information Systems, Inc. and Integral Systems, Inc., sent out a conflicting message in some ways, simultaneously suggesting that AD/Cycle exists today and that it will take years to implement.

Bachman is an official AD/Cycle tool provider while Integral is an applications developer with a marketing deal with IBM and a self-proclaimed AD/Cycle user.

AD/Cycle is IBM's strategic application development environment, which is intended to unite the various computer-aided software engineering tools and ultimately replace the time-consuming and costly programming efforts being used today.

AD/Cycle itself is an architecture, while the actual products will be a host software repository of information about the application development process that will eventually include integrated tools that will be able to work with it.

Officials of the two third parties and Earl Wheeler, an IBM vice-president and general manager of programming systems, suggested that there are really two AD/Cycle levels. The first exists today and includes any of the existing tools that were anointed AD/Cycle tools last year.

Jerry Valente

> "YOU WERE using [AD/Cycle] even before we announced AD/Cycle."
>
> EARL WHEELER
> IBM

The second level, which will be the full-blown integrated tool environment, is not here yet and will take years to migrate to. Wheeler said the integration will begin next year and suggested that users chart out a three-year plan to make this move.

"AD/Cycle will deliver many things over time, but AD/Cycle is here today," said Charles Bachman, president of Bachman. "It's IBM's architecture around tools from many sources . . . and pieces of it are here now. It's not a promise."

Brian Aspland, president of Integral, added, "We've been using AD/Cycle for three or four years now."

Observers suggested that this claim is stretching the limits of the AD/Cycle definition.

"I don't buy that," said Vaughn Merlin, president of Case Research, Inc. "It's a grand scheme and a long-term vision. We expect what we see in June will add some flesh to the skeleton," he said of the upcoming release of the Repository Manager.

Nonetheless, Wheeler insisted that AD/Cycle exists today. "You were using it even before we announced AD/Cycle," he said.

"He is literally correct but conceptually not correct," George Schussel, president of Digital Consulting, Inc. in Andover, Mass., said of Wheeler's claim.

Andree Abecassis

> "WE'VE BEEN using AD/Cycle for three or four years now."
>
> BRIAN ASPLAND
> INTEGRAL

Conceptually, AD/Cycle is intended to be a full life-cycle development environment that includes host software and various software tools. The goal is to integrate the diverse and incompatible tools customers now use and make sure they operate according to one, consistent application development architecture.

Light-years away

Wheeler acknowledged that such a goal is years away. He likened it to the cultural change "30 years ago when programmers had to leave machine language and go to a thing called compilers."

As such, he recommended that customers first either establish their own blueprint or plan on moving to AD/Cycle over a three-year span. Wheeler said that such blueprints have been created within IBM, which calls itself an AD/Cycle user.

"I've had the opportunity to review several of them, and it really is a transitional evolution over a three-year period of time," Wheeler said.

He added that the second level of AD/Cycle will officially begin with the release of the Repository Manager, because developers will then be able to hook their tools into AD/Cycle.

Wheeler also said that IBM has scheduled a meeting with developers for next month, when the first round of interfaces will be provided for them to tailor their products to AD/Cycle.

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Wavetracer breaks in on supercomputing

BY MARYFRAN JOHNSON
CW STAFF

BOSTON — C-c-catching the latest wave in supercomputing is what Wavetracer, Inc. hoped to do recently as the Massachusetts-based start-up unveiled a "three-dimensional," massively parallel computer designed for complex scientific and mathematical problem-solving.

Wavetracer President Richard Fiorentino claimed the Data Transport Computer will deliver supercomputer-level performance — in certain highly specialized applications — for a fraction of the $1 million to $20 million price of a supercomputer from Cray Research, Inc.

However, Wavetracer refused to release any performance figures. The company described its architecture as 3-D and massively parallel Single Instruction Stream/Multiple Data Stream, which allows for execution of the same instruction on thousands of processors simultaneously but with each dealing with its own data element.

THE SYSTEM, slated to be commercially available next month, runs slower than a small Cray but faster than top-end workstations.

"The people interested in this technology will recognize how powerful it is when they hear it can solve one-million- and four-million-node electromagnetic problems," said Robert Utzschneider, director of marketing at Wavetracer. He said the system, slated to be commercially available next month, runs slower than a small Cray but faster than top-end workstations.

In three models priced at $98,000, $125,000 and $413,000, the Data Transport Computer houses 4,000, 8,000 and 16,000 one-bit-wide processors, respectively.

Narrow niche?

The integrated 3-D graphics in the Wavetracer system should give it an advantage over traditional supercomputers, said Omri Serlin, an analyst and president of Itom International, Inc. in Los Altos, Calif. "But this still sounds like a very narrow niche player," he added.

Using a small computer systems interface to connect with Unix-based workstations, the Data Transport Computer will be sold as a computationally intensive back-end machine or a network server for high-performance workstations.

All of its programming is done in the C language, and the company also introduced a parallelizing C compiler called Multic for users who want to create their own multidimensional applications.

Sikorsky Aircraft in Stratford, Conn., will serve as the beta-test site for the machine, running EM Wavetracer, an electromagnetic design and analysis tool and the only application package currently available.

Joe Piteo, manager of engineering automation at Sikorsky, said his shop will use the software in radar cross-section analysis — a component of low-observability research more popularly known as stealth technology. Piteo said he plans to connect the Data Transport Computer to a network of Sun Microsystems, Inc. workstations and hopes to eventually introduce the new technology to hundreds of his engineers "rather than just half a dozen."

"What we need is something we can stick on a network, transparent to the users, at the right price. This system fills a niche not being filled by other companies right now," he said.

You Can't Tell

THE NEWSWEEKLY OF INFORMATION SYSTEMS MANAGEMENT
May 7, 1990 · Vol. XXIV · No. 19 · 122 Pages · $2/Copy · $48/Year
COMPUTERWORLD

INSIDE
In Depth — Boos
MVS performanc
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A golden oldie
needs updatin
Page 67.

PRODUCT SPOTLIGHT
BUYERS' SCORECARD
Global rings up lead in ledger ratin

BY MICHAEL L. SULLIVAN-TRAINOR

Pitted against the titans of accounting software, Global Software, Inc., a $23-million enterprise, differentiates itself by stubbornly sticking to its knitting.

In the face of Computer Associates International, Inc.'s (CA) acquisition binges and the merger of Management Science America, Inc. (MSA) and McCormack & Dodge (M&D) — both now part of Dun & Bradstreet Software — Global continues to maintain a strong mainframe general-ledger user base (10% of the market) by paying attention to such details as customer support.

Of the four top mainframe general-ledger packages rated by the 280 users surveyed, Global's offering received the highest overall score. The respondents rated only the software they are currently using, with a minimum of 70 users rating each package. Total scores for each package were based on a weighted combination of the numerical ratings of all 21 criteria (see methodology next page).

Global ranked highest in the nuts-and-bolts areas of accounting applications: availability and crash recovery, ease of use and service and support. Users say that the company's support service for installation, called Software Walkthrough, provides above-average assistance in getting the package up and running.

"A lot of vendors will run a sample of someone else's data and say, 'This is what your system will look like,' " says Bob Bulliard, program supervisor at Lafayette General Medical Center. "Global took our data to their Raleigh, N.C., site and ran it for us so we could iron out the requirements."

M&D's general-ledger package received the second highest overall user rating, scoring 41 points to Global's 43. However, users gave M&D's package a slight edge over Global in meeting current business needs — the criterion most important to users. The package was rated significantly higher overall in new technology areas, such as the relational database interface.

MSA's general-ledger package rated one point behind that of its merger partner in the overall score and scored higher than the other packages in custom report generation, effective training and integrating with other modules.

CA's general-ledger product, which came up four points short of the highest score, topped the field in terms of the portability of its programming language and scored strong second-place ratings in overall performance and pricing.

Respondents rated the basic functions of the products as more important than the hot technology areas. They gave the vendors superior marks overall in meeting primary requirements. However, lower ratings were assigned to new areas such as expert systems, networking and adapting to distributed technologies.

Sullivan-Trainor is a *Computerworld* senior editor, features.

COMPUTERWORLD BUYERS' SCORECARD

A summary of the hi ratings shows the most effective aspects of each

Product: General Ledger	Score	Strengths Top three ratings:
Global Software's GL (Response base for all products: 70)	43	First-place finishes: 9 Availability & recovery Ease of use Service aod support
McCormack & Dodge's GL	41	First-place finishes: 6 Meeting current business needs Range of functions Integrating with other applications
MSA's GL	40	First-place finishes: 5 Custom report generation Effective training Integrating with other modules
Computer Associates' GL	39	First place finishes: 1 Portability of programming language Overall performance Installation and maintenance pric

Hamilton

FROM PAGE 25

problem with AD/Cycle misinformation, it's because there's a lack of hard facts from IBM for the users to work with.

Take, for instance, the information model component of AD/Cycle. You can't get much more critical than that. The information model is what will give AD/Cycle the definitions and guidelines needed to simplify application development. In reporting on AD/Cycle earlier this year, I came across nearly as many definitions of the information model as I did people to talk to. The problem here is that IBM has never spelled out exactly what the information model is.

An interview late last month with Steve Uhlir, a manager of platform architecture at IBM, produced the following exchange about the information model.

First he was asked what the information model is. Is it software? Is it a set of specifications? Is it a set of interfaces?

"Fundamentally, the information model is a definition provided by IBM of the information that is to be shared across the life cycle by tools that assist in application development," Uhlir said. "It's between software and an interface. It's not object code. It's the definition of data. It's defined in the Repository Manager. It's not just a paper definition."

Well, call me slow, but I still wasn't sure. Later I asked again. This time I asked what phrase I should use to describe the information model.

"This is one reason why people get confused about what we are doing," Uhlir said. "We haven't found a good term for what it is. In a very narrow sense, let me try this definition. It's a set of entity and relationship definitions in the Repository Manager and a set of rules for using those entities and relationships."

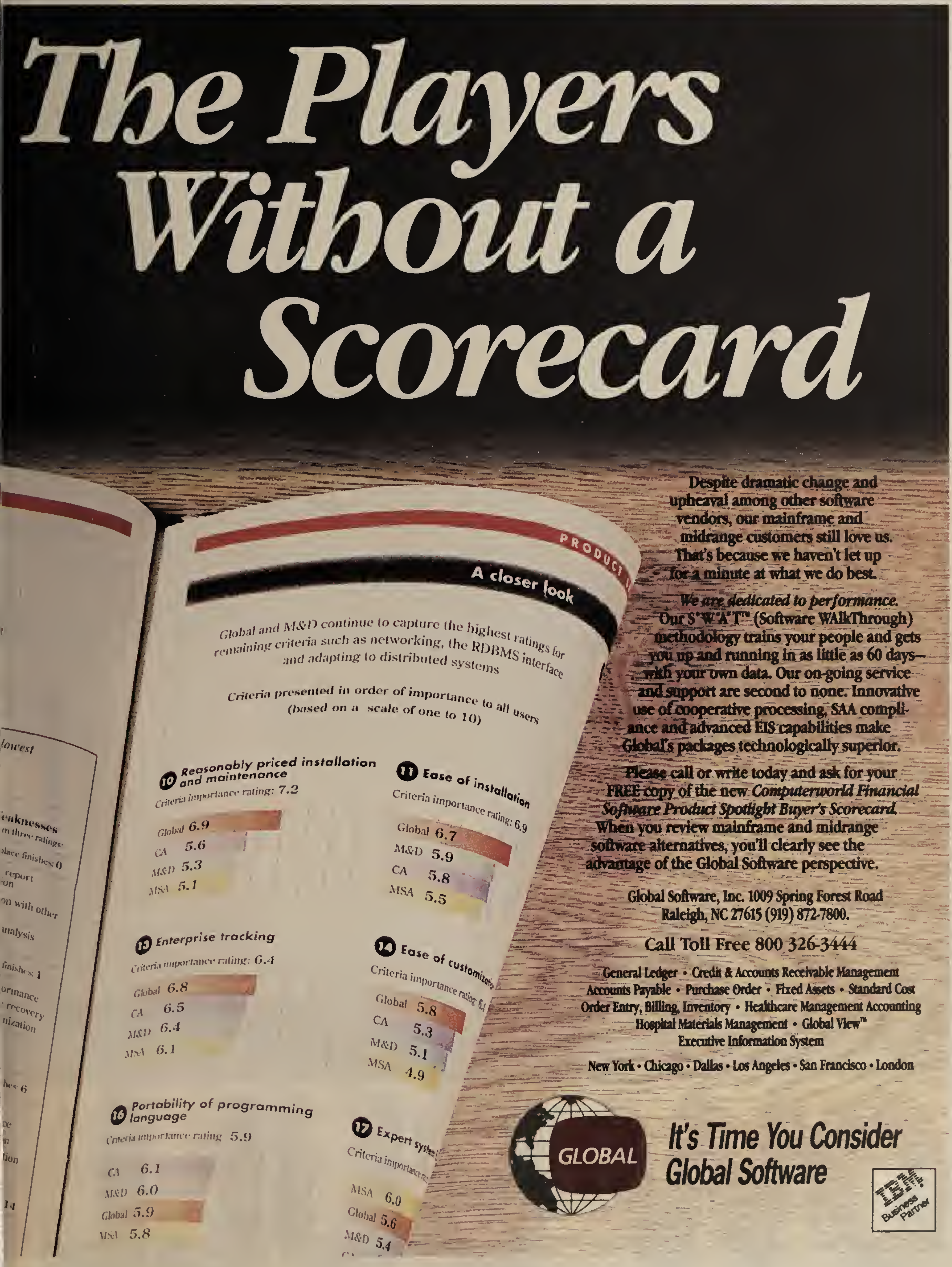
OK, but is it software code?

"Well, it's shipped on the Repository Manager tape," Uhlir said. "It's certainly computer-readable, but I think of code as something a CPU can do something with. I guess it's sort of a language known by the Repository Manager, rather than code processed by the CPU."

No question, the information model is hard to put into words. I don't think anyone would suggest otherwise, and people certainly understand that IBM has a hard task in explaining it. But it is IBM's job to do this, period.

IBM will tell you that it is difficult to explain the information model because it continues to be created. Give users some credit — surely they can understand a definition of what it is today, where it will go and what it will likely be in the future.

Hamilton is *Computerworld's* senior editor, systems and software.


PRODUCT
A closer look
Global and M&D continue to capture the highest ratings for remaining criteria such as networking, the RDBMS interface and adapting to distributed systems
Criteria presented in order of importance to all users (based on a scale of one to 10)
10 Reasonably priced installation and maintenance
Criteria importance rating: 7.2
Global 6.9
CA 5.6
M&D 5.3
MSA 5.1
11 Ease of installation
Criteria importance rating: 6.9
Global 6.7
M&D 5.9
CA 5.8
MSA 5.5
13 Enterprise tracking
Criteria importance rating: 6.4
Global 6.8
CA 6.5
M&D 6.4
MSA 6.1
14 Ease of customization
Global 5.8
CA 5.3
M&D 5.1
MSA 4.9
16 Portability of programming language
Criteria importance rating 5.9
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HARD BITS

Bull, Cygnet ink OEM deal

Cygnet Systems, Inc. and **Groupe Bull** have signed a two-year OEM agreement covering the purchase of Cygnet's Series 1800 Expandable Jukeboxes and Model 5250 jukeboxes as part of Bull's Image Works Document Imaging System. Cygnet's 12-in. write-once read-many (WORM) optical disc drives and 5.25-in. WORM and erasable optical disc drives will become part of Image Works' system for managing, filing and retrieving documents that combine text, graphics and images.

Digital Equipment Corp. and Atlanta firm **Secureware, Inc.** are jointly developing U.S. government-certified security features for Ultrix, DEC's version of the AT&T Unix System V operating system. DEC will license Secureware's CMW Plus software for use in the U.S. Defense Intelligence Agency's Compartmented Mode Workstation program, which addresses workstation security at the user level. Vendors who meet the defense agency's security requirements will be authorized to sell workstations into government intelligence agencies.

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Bull

MAI coaxes its customers onto Unix

After Prime takeover bid crashes, MAI wades into software standards

BY J. A. SAVAGE
CW STAFF

A year after MAI Basic Four, Inc.'s failed bid to take over Prime Computer, Inc., the company has regrouped and is introducing hybrid computers to wean its installed base from its proprietary operating system and onto the Unix standard.

Staying in the multiuser, commercial environment, the company launched two new computers last month. Both have what MAI called the "Dual Universe" operating system, a combination of the BOSS operating system MAI has used since 1972, and Unix, with an integrated file system at the kernel level, according to Gary Brenkman, director of systems marketing at MAI.

Proprietary operating system users, which the company estimated to number 40,000, can use old applications while rewriting them to open systems or switch between the two using the dual operating system, according to MAI.

The GPX Series 5070 and 6070 use a parallel computing architecture from Sequent Computer Systems, Inc. The Intel Corp. 80386-based computer has been modified by MAI, adding a 32-bit VME bus, a subsystem for modularly expandable power supplies and a module to combine printer and port functions. It is made up of about 30% Sequent material and 70% MAI elements, Brenkman said.

The GPX Series 5070 goes from two to four CPUs at a base price of $69,000; the GPX Series 6070 goes from two to 10 CPUs with a base price of $107,4000. They can handle up to 192 and 360 users, respectively.

Next year, the systems will be upgradable to the Intel 80486, according to Brenkman.

The project with Sequent was started long before the Prime bid, and the three-year development may account for the large chunk of MAI hardware input.

MAI also introduced a low-end multiuser system with the dual operating system. Based on what Brenkman would only call "an offshore vendor's" 80386-based hardware, the GPX Series 40 supports up to 32 users with a base price of $23,700.

After the takeover of Prime fell through, MAI reorganized, changing its geographically based distribution to vertical business sectors such as credit unions, health care and hospitality. While the company has traditionally been a minicomputer maker, it is now moving toward being a value-added reseller. It is not disavowing hardware manufacturing completely, but it is doing so selectively, according to Brenkman.

> WHILE MAI has traditionally been a minicomputer maker, it is now moving toward being a value-added reseller. It is not disavowing hardware manufacturing completely, but it is doing so selectively.

ISM widens software horizons

BY MAURA J. HARRINGTON
CW STAFF

The Information Systems Manager, Inc., recently added a graphical user interface option and other enhancements to its Capacity & Performance Management software and service.

With the release of Version 3.1 of the product, ISM also expanded its focus to cover the entire U.S. The software was first introduced to the Northeast in 1987.

The new version includes 24-hour analysis in greater detail for all devices, modeling enhancements and more graphical user interface options for easier access to information, said James VanArtsdalen, co-founder and president of ISM.

The Capacity & Performance Manager also now features work-load management capacity of as many as four host systems, rather than its previous level of two, the company said. New features also include "what if" tuning, the capacity to model changes to the processors, real storage and the I/O subsystem.

By taking a customer's Resource Measurement Facility data, automatically stored in MVS on an IBM or compatible mainframe, the ISM staff will categorize performance information and generate a monthly report on the capacity and performance of the system for its customers, VanArtsdalen said.

The ISM reports contain more than 40 color-coded charts with a complete analysis of capacity and performance of the data center in five areas: historical trends & forecasts, processor complex, memory paging, I/O subsystems and work-load analysis, VanArtsdalen said.

Jim Edwards, facilities and planning manager at Westwood, N.J.-based BMW of North America, agreed. BMW uses the product at its corporate headquarters and has been able to maintain high performance and prevent a response-time crisis because of its use in the data center, Edwards said.

The Capacity & Performance Management software runs on an Intel Corp. 80286- or 80386-based personal computer with an Enhanced Graphics Adapter or Video Graphics Array monitor and hard disk drive, the firm said.

Pricing for the software and services offered by ISM includes a one-time setup fee of $3,500 and a $1,000 monthly base service fee.

NEW PRODUCTS — SOFTWARE

System software

Islandview Associates, Inc. has announced Marcus 4.0, a marketing and customer support software package designed for users of IBM midrange systems.

The product can automate marketing functions such as territory management, direct mail, sales reporting, literature fulfillment and mail list management. It interfaces with IBM's Query, Displaywrite and Officevision and runs in native environments of the IBM Application System/400 and System/36.

Marcus 4.0 is being sold primarily through affiliates for $4,000 to $20,000, depending on CPU size. A single-user personal computer laptop version costs $495.

Islandview
4401 Dominion Blvd.
Glen Allen, Va. 23060
804-747-0717

Marcus 4.0 *support package*

Systems Concepts, Inc. has announced a new version of its Shadow for VMS, a disk mirroring system designed to provide transparent support of volume shadowing for a local or Vaxcluster system.

Version 2.2 allows users to create an unlimited number of shadow sets, with each set supporting up to 10 members, the vendor said.

Version 2.2 of Shadow for VMS is being offered with an initial license, documentation, media and warranty services for $2,000 to $10,000, depending on CPU model.

Advanced Systems
33-41 Newark St.
Hoboken, N.J. 07030
201-798-6400

Utilities

Quixx Corp. has announced CICS-Search, a document storage and retrieval tool that uses KSDS VSAM datasets.

The product includes a single screen that holds up to 14 structured fields, 16 free-format fields and five lines of free-form text. Optional multiple screens store free-form text, which can be edited with a built-in line editor. Without using command-level language, users can locate records based on structured data as well as every word in a character string stored on the first screen, the vendor said.

CICS-Search operates under CICS in MVS or DOS/VSE. A license for the DOS/VSE version costs $9,500; MVS licenses sell for $12,300.

Quixx
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NEW PRODUCTS — HARDWARE

Processors

Nemonix, Inc. has introduced a CPU accelerator for the Digital Equipment Corp. VAX 8550.

The NX850-XL is completely transparent to existing hardware and software and can be installed in 30 minutes, the vendor said.

The add-on module can also be disabled with a flick of a switch to return a system back to its original configuration.

The product is being offered at an introductory price of $9,995 with a two-week right-to-return offer.

Nemonix
106 South St.
Hopkinton, Mass. 01748
508-435-9087

Data storage

Interlink Computer Sciences, Inc. has announced a product that enables users of Digital Equipment Corp. VAX systems running VMS on Decnet networks to store files, directories or entire disks on IBM tape devices linked to IBM processors.

Datastore 1000 can be used on either an IBM 3490, 3480 or 3420 tape device. It operates with IBM's MVS and VM operating systems.

Datastore 1000 is currently available and is priced at $30,000.

Interlink
47370 Fremont Blvd.
Fremont, Calif. 94538
415-657-9800

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Douglas Barney

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Computer makers have heard their complaints. That's why vendors have been making laptops and the even lighter notebook computers. These chuckleheads are only developing for one slice of the market. They think every portable user travels across the country, computing on airplanes and in lobbies.

Some of us want a portable because we are bucking for a promotion and simply want to lug a machine home to work with at night or on weekends. A laptop is fine for this purpose, if

Continued on page 45

Help keep America computing

With the right mix of people and technology, help desks can be valuable assets

BY SALLY CUSACK
CW STAFF

The help desk just may evolve into corporate America's unsung hero of the '90s, providing that companies are successful in determining which platforms and types of services will be most valuable to both users and help desk personnel.

Corporate help desks are used to resolve daily problems, anticipate future computing and applications needs and serve as monitors for employee and departmental progress.

However, many organizations simply have not hit upon the right combination of technology and people skills to maximize their help desk services effectively.

"When you look at the cockpit of the help desk, you find that the help support staff doesn't always have adequate tools," said Ronald J. Muns, director of the Help Desk Institute and president of Bendata Management Systems, Inc., both based in Dallas. The kind of platform used can also make or break a help desk center, he added.

When Manufacturers Hanover Trust Co. in New York launched a full-fledged help desk support program in 1987, the company committed to a Microsoft Corp. Windows environment across the organization.

The two-person help desk supports more than 3,500 users nationwide and handles approximately 60 requests for assistance each day on a Windows-based Novell, Inc. Netware-based local-area network.

According to Diane Gomes, a senior technical officer at Manufacturers Hanover, the company relied heavily on user input when designing the help desk.

"We chose Windows because we found that it was the wave of the future and that it also best conceptualizes the way people actually work," she said. "The human mind is visual and multitasking. It is constantly integrating information."

The company supplements its help desk with on-site seminars, two training facilities, demonstrations and documentation. It is constantly evaluating the system and seeking user feedback.

"The ideal we initially held when creating the help desk was that all information needs to be confined to one spot, and we are really committed to the concept of an easy-to-use interface for our end users," Gomes said.

Although the Windows platform fulfills the company's needs in both areas, Gomes cautioned that the Windows enviroment generates more complex questions from users than single command-driven programs are wont to do. It is easier for a user to describe a command-line problem

Continued on page 44

Have Lotus, IBM got an OS/2 deal for you?

BY PATRICIA KEEFE
CW STAFF

Lotus Development Corp. and IBM have teamed up in a bundling effort to boost their OS/2-related sales. At this early date, however, it is unclear how much of a price saving users can expect.

The two companies have put together the Lotus 1-2-3/G Bonus Pack promotion, which consists of 1-2-3/G, IBM's OS/2 Standard Edition Version 1.2 and 4M bytes of memory for IBM Personal System/2 users.

The bonus pack will be available until Aug. 31 through resellers certified to market IBM's advanced products. It applies to all IBM PS/2s, although in some configurations a memory adapter is required.

The bonus pack appears to have been designed to address some of the standard complaints about OS/2 — namely, the lack of a "killer" or strong application and the cost of adding additional memory. "It's a really strong bundle of products for those who are already in the OS/2 market," said Diane Merz, a spokeswoman for Egghead Discount Software.

"I'm not sure if putting two not-so-good moving products together is helpful," said Matt Fitzsimmons, a Computerland Corp. franchiser in White Plains, N.Y.

"I don't know if [the bonus pack] by itself is enough to move OS/2 sales," added Christopher Ward, a spokesman for Corporate Software, Inc., a Canton, Mass., reseller. "Moving OS/2 is more than a product bundling problem; there's the necessary support and justification issues." Ward said Corporate Software is looking at adding that kind of value to the bonus pack.

Since neither IBM nor Lotus has provided resellers with a suggested price, most resellers are still trying to set a pricing policy. "It's frustrating, is what it is," one reseller said.

The bonus pack components total roughly $2,835, based on suggested retail price: about $900 for each of IBM's two 2M-byte chunks of memory, $695 for 1-2-3/G and $340 for OS/2 1.2. Ward said that Corporate Software will offer the promotion at "well under $1,100."

"Egghead will make the bundle available for less than a third of what those products would cost if purchased separately," Merz said. The bonus pack will be sold through Egghead's direct sales channel, so final pricing will depend on the volume purchased, she said.

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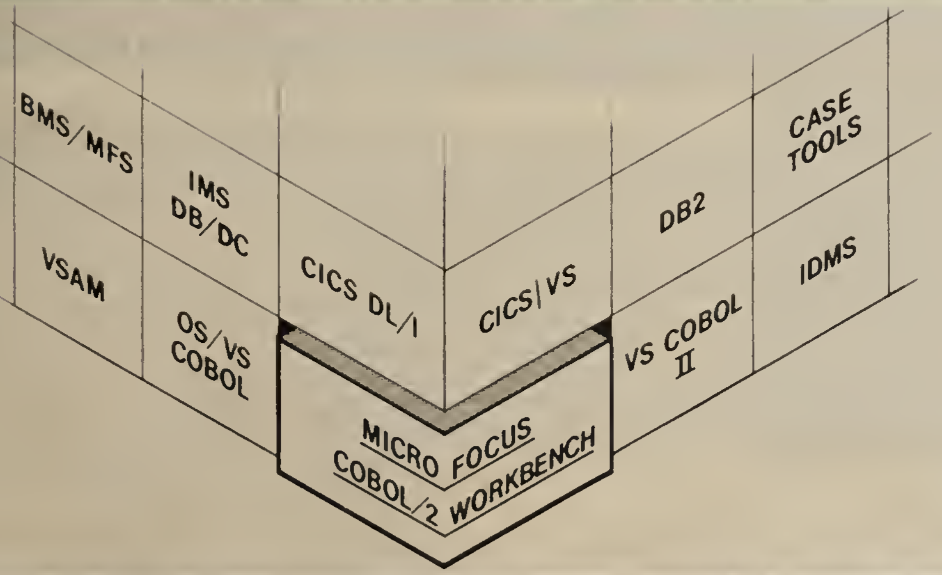

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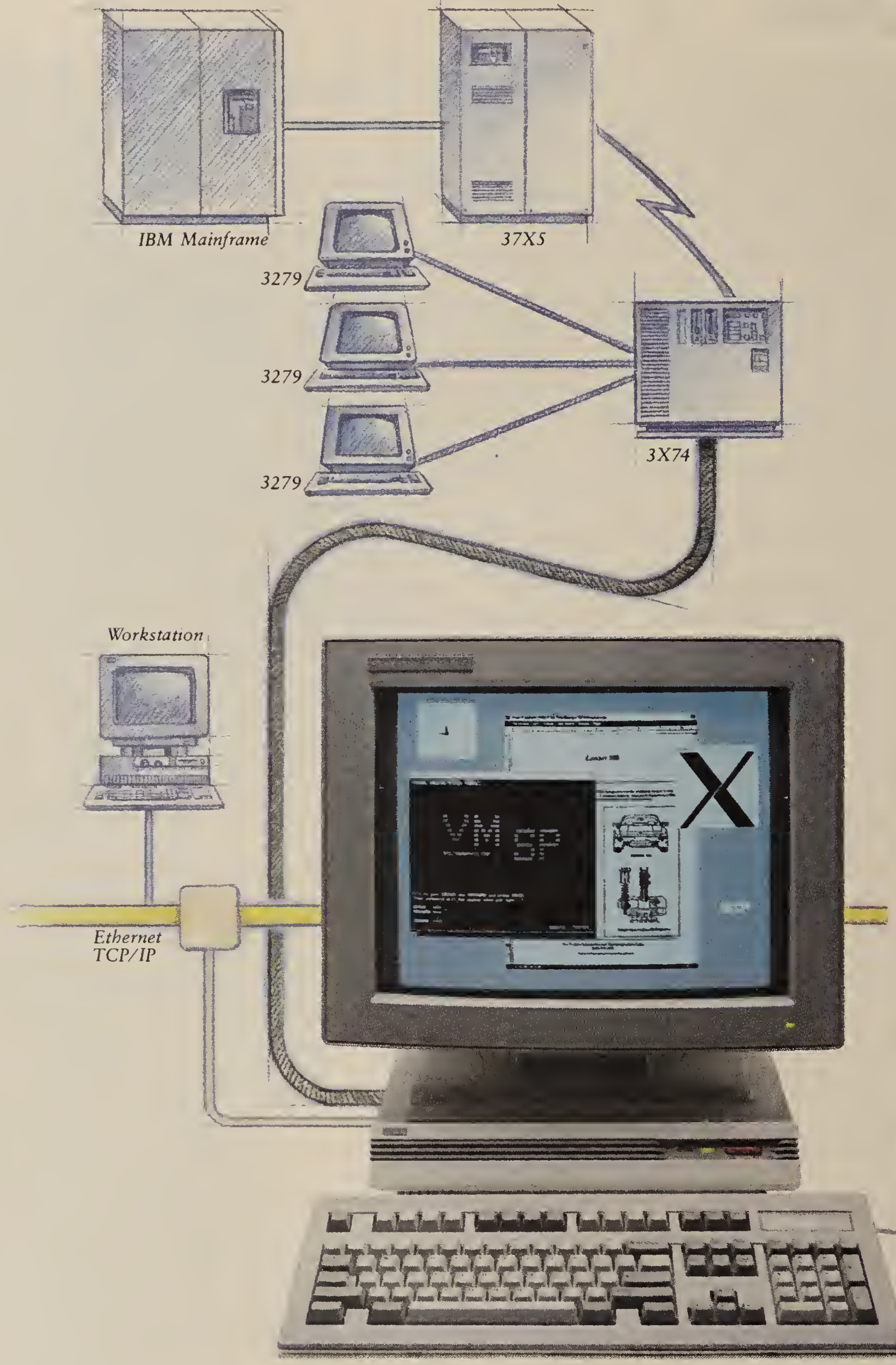

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Monarch marks spot for PCs

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BY PATRICIA KEEFE
CW STAFF

DAYTON, Ohio — Monarch Marking Systems, Inc.'s software development efforts got a boost recently from a Novell, Inc. Netware-based local-area network centered around two Compaq Computer Corp. Systempros. Now, if the maker of bar-code printers and systems could just iron out the link between the LAN and its Digital Equipment Corp. Ultrix-based system, its developers could really begin to cook.

Monarch moved all of its personal computer-targeted software development cycle to PCs 1½ years ago and segued into a network about two months ago. "When we went to separate PCs, we lost source code control. Now, with the network, we're able to get that back by using common files stored on the same disk," said Steve Goldberg, director of engineering at Monarch, a division of Pitney Bowes.

The two 33-MHz Intel Corp. 80386-based Compaq Systempro servers running Netware 386 3.0 anchor an Ethernet network with 45 users.

The Systempros serve separate needs. One features a 840M-byte drive and functions as the "ultimate" file server for the developers. The other Systempro comes with a 420M-byte hard drive and serves as a system for department administration and management functions.

Also attached to the Ethernet are a number of DEC terminals tied to a dual Microvax 3602 server running Ultrix. "We [still] do development in the DEC environment," Goldberg said.

Long term, he said he wants to move DEC system-based programming onto the PCs. "Our guys on the VAX are chomping at the bit to move over."

So far, Goldberg is pleased with the Systempros. "Although we have the two servers, an entire network and a VAX on one Ethernet cable, there have been no performance problems — even with quite a bit of information traveling back and forth." He said users are able to pull files off the servers faster than off their local disks.

Goldberg *relied on his gut feeling*

Goldberg credits both speed and security to the Systempro's disk array architecture, which he said differentiates it from the average 386. "There's also the ability with an intelligent disk array to run in redundant mode," he said.

The decision to go with Systempros rested heavily on a gut feeling about the firm. "We have a lot of Compaq equipment in-house, and they have been an excellent vendor for us. We felt the Systempro would give us all the power we were looking for," Goldberg explained. "We'll probably upgrade to the 33-MHz [Intel I486-based] Systempro when they become available."

Goldberg's development team is stymied by a lack of good communications between the Ultrix-based Microvax and Netware. Although Netware runs under DEC's VMS, it does not support Ultrix.

This is a problem inasmuch as Goldberg would like to make his Netware server more subservient to the Microvax server. Ultimately, he'd like to use the Microvax as the central repository for his PC-based development efforts. The Microvax can provide a more secure environment, for example, by providing automated backup procedures. This is difficult now, because the Netware driver and Compaq's tape drive don't work well together, Goldberg said.

"We've had meetings with Compaq, Novell and DEC, but no one was able to give us the seamlessness we are looking for," Goldberg complained. He said that there are third-party products that run under Netware, Version 2.1.5, that "gave us a nice, seamless interface" with the Microvax system running Transmission Control Protocol/Internet Protocol, but these products have not yet caught up with Netware 3.0.

"The third parties have all told us, 'Give us six months, and the [Netware 3.0 upgrades] will be out.' " Goldberg may have to wait even longer, since Monarch plans to upgrade to Netware 3.1, which just began shipping.

Meanwhile, Monarch makes do with PC Interface, a third-party product that only allows Netware to use the Microvax as an alternative DOS file server and to transfer files from the Systempro to the Microvax.

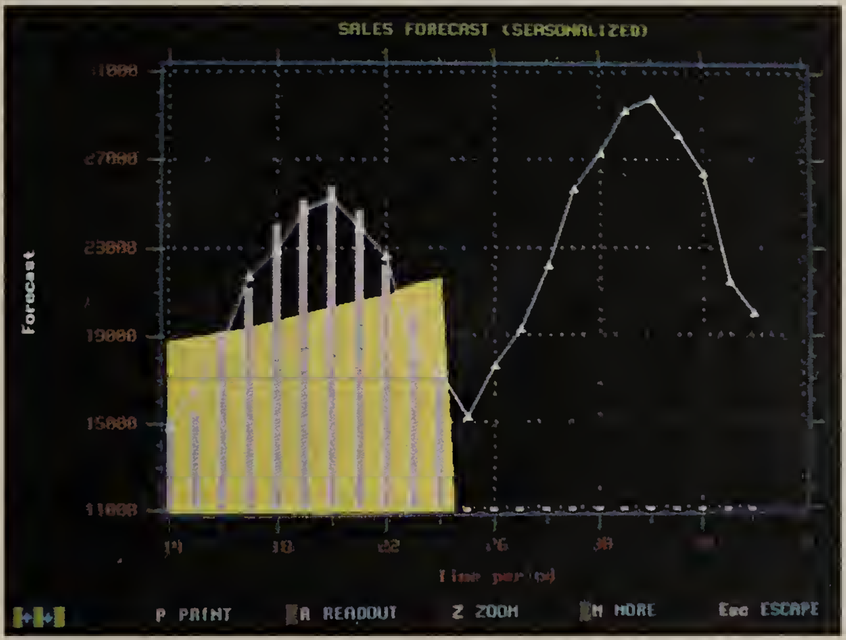
Keep your Business Wits about you

Software makes business analyses as simple as filling in the blanks

BY RICHARD PASTORE
CW STAFF

While accountants and financial analysts have been using computer spreadsheets for years to turn numbers into analyses, some users complain that spreadsheets take too long and are too complicated to program.

Decisus, Inc., a Xerox Corp. division, has tried to address this issue with an object-oriented decision-support software package called Business Wits.



Business Wits *has 118 preprogrammed analysis formulas*

The package, which began shipping in March, contains 118 preprogrammed business analysis formulas. Rather than programming formulas and setting up spreadsheets, users fill in the blanks when prompted for data — the program performs the calculations. Four optional library modules contain formulas targeted at financial analysts, bankers, investment counselors, accountants and chief financial officers.

Users said that Business Wits is quicker to use than conventional personal computer spreadsheets. "Programming and setting up spreadsheets was very time-consuming; Business Wits let us cut down on the time," said Joe Walker, president of Walker Engineering & Consulting in Knoxville, Tenn.

"I'm sure it will save our investment banking analysts a lot of time; I've seen spreadsheets they've spent years developing," said Arthur Fu, an investment analyst at Oppenheimer & Co. in Los Angeles.

The time savings also allow users to run additional analyses. "I can add such things as sales forecasting and personnel requirements — things that aren't necessary to the business plan but give me a much wider view," Walker said.

Another benefit is the package's design for use by computer novices. Someone unskilled with spreadsheet programs could potentially botch up a complicated spreadsheet, Fu said. However, even nonanalysts can use Business Wits because "it prompts you for the input, you press C for calculate, and it's done," Fu said.

Fu has been testing the program since November 1989 and plans to introduce it to his firm's 25 investment banking analysts. Users' complaints centered primarily on output. The software is optimally suited for laser rather than dot matrix printers, Walker said. "They could improve the appearance of the dot matrix output," he said, adding that the program's graphics printing was a bit too slow as well.

Though they praised the ease of use of the documentation, users said the terminology took some getting used to. "It's a different category of software, so I had trouble getting used to their terminology," Fu said.

Fu recommended at least a 12-MHz Intel Corp. 80286-based PC and a 60M-byte hard disk for running the program.

Walker said he found little else in this category of decision support software. "I looked at some project management software, but the price range was ridiculous — $1,500 to $2,000."

The main Decisus program costs $695, while the modules are priced at $195 each.

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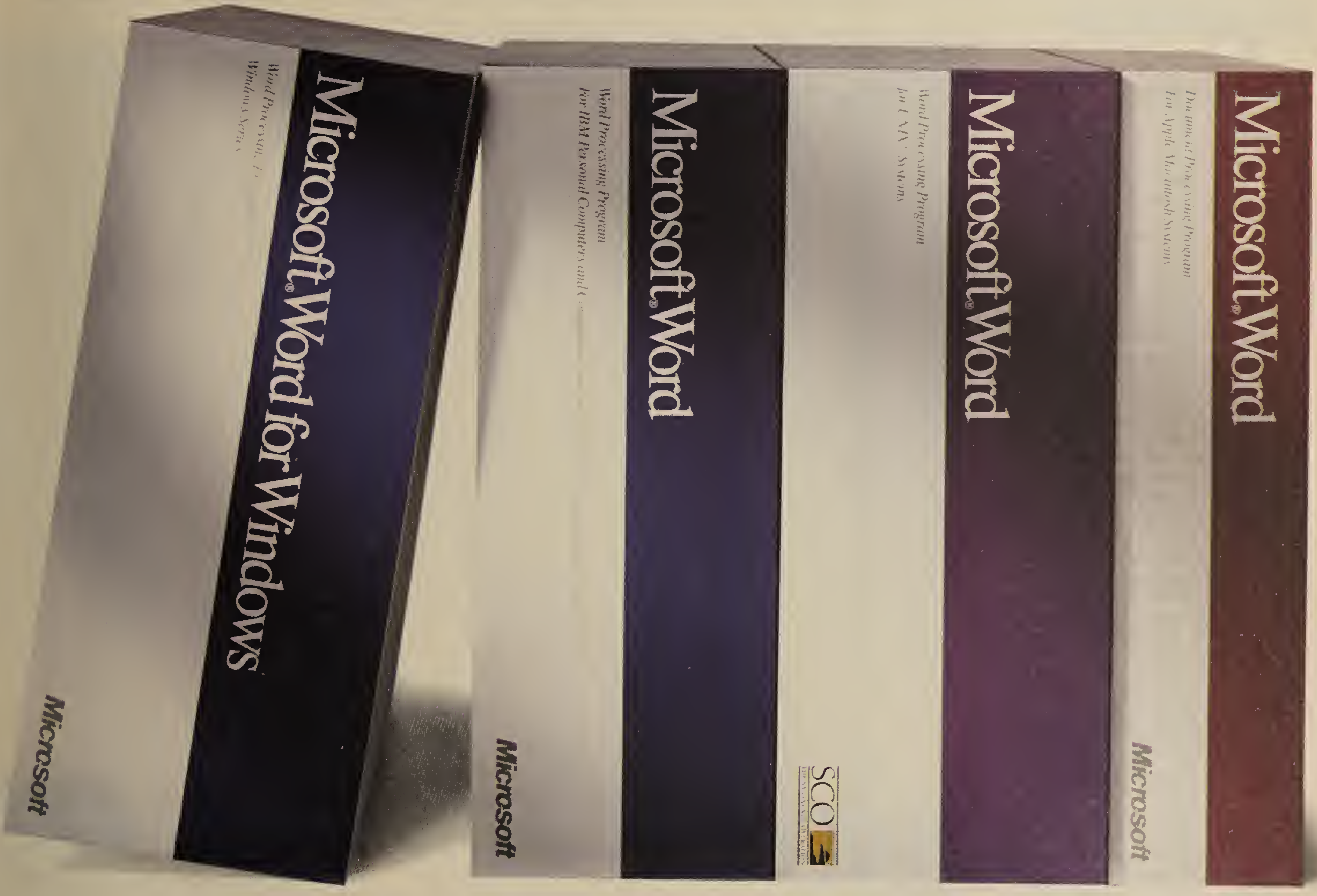
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Help

CONTINUED FROM PAGE 37

to a person on the help desk phone than it is to relate the more abstract "point-and-click" action, Gomes said.

As no single computing environment will fulfill every company's needs for the ideal help desk tool, each firm must establish its own criteria based on company size, resources and user requirements.

Muns said his firm chose the Quarterdeck Office Systems Desqview environment when developing its help desk product, H.E.A.T. Bendata evaluated Windows, OS/2 and other platforms before committing to a Desqview environment, based on tests showing that Desqview provided the fastest response time.

"Response time was the No. 1 priority with us," Muns said, adding that the lack of development tools under Windows at the time was also factored into the decision to go with Desqview.

Aside from selecting appropriate hardware and software tools based on criteria such as speed and ease of use, the help desk must also keep a constant check on its effectiveness in servicing the user community.

Quoting figures from an internal employee survey, Gomes said that 82% of Manufacturers Hanover's users found their desktop personal computer to be "extremely helpful," while another 16% of the organization reported that the machine was "somewhat helpful."

Gomes and Muns agreed that intuitive user interfaces and pull-down menus are essential for both end users and help desk staff. A LAN-based setup is the optimum configuration for help desk support, they added.

Muns recommended conducting a comprehensive needs assessment plan based on feedback from data center personnel, management and end users before implementing a help desk. The help desk must also sell itself and its role within the organization, Muns added. It is important to provide users with brochures or manuals on services, policies and procedures. Other alternatives include publishing newsletters, forming user groups and holding open houses to familiarize new users with available services.

Manufacturers Hanover, for example, takes a "road show" to different company sites to show end users which help services and products they can access via the corporate help desk center.

"The last few years have seen an explosion of end-user computing tools, which has resulted in a population of enlightened end users calling for help with new computing capabilities," Muns said.

Lotus adds Alphaworks to portfolio

BY PATRICIA KEEFE
CW STAFF

CAMBRIDGE, Mass. — Lotus Development Corp. sharpened its focus on the low end of the integrated software market two weeks ago by buying Alpha Software Corp.'s Alphaworks 2.0.

The purchase is part of a concentrated effort to mine market share among first-time personal computer users and small businesses. Lotus also provides a spreadsheet for Tandy Corp.'s Deskmate graphical environment, is bundling its 1-2-3 Release 2.2 with Great American Software, Inc.'s One Write and has teamed up with IBM to provide small business development centers for training purposes.

"These are not disconnected efforts," said Tim McManus, director of marketing for Lotus' integrated software products division. "We are trying to develop a portfolio of products for this fast-growing market."

Priced at $149, the renamed Lotusworks is a multifunction program that integrates spreadsheet, database management, word processing, graphics and communications capabilities.

Lotusworks supports the .WK1 file format for spreadsheets and the .DBF file format for databases; that is the extent of the migration path to Lotus' Symphony.

Some analysts were puzzled by the purchase; most said they expect its impact on the spreadsheet maker's bottom line to be negligible. Terms of the transaction were not disclosed.

Rick Sherlund, an analyst at Goldman, Sachs & Co., suggested that the integrating environment provided by Microsoft Corp.'s Windows 3.0 will erode the need for high-end integrated packages such as Symphony. "The real action is at the low end," he said, adding that potential Symphony users may opt to purchase the cheaper Lotusworks.

McManus argued that Windows 3.0 just provides the tools needed to integrate applications and added that it is too early to tell whether they will be used. He also claimed that Symphony 2.2 sales have been strong but declined to elaborate.

To capture the interest of the low end, Lotus announced a new bundling pact with Packard Bell Electronics, Inc. and will continue similar arrangements that Alpha Software had with Olivetti USA and Poqet Computer Corp. McManus said more OEM deals are expected.

"I don't know that anyone ever makes much money on bundling deals," Sherlund said, suggesting that Lotus will attempt to build market share on price.

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Barney

CONTINUED FROM PAGE 37

your office machine is a wimpy XT or AT. But if you've taken the leap to Microsoft Windows and DOS extended applications, or if you are one of the weenies who has made the leap to OS/2, then today's laptops just barely cut it.

Don't get me wrong. Today's lappers can run the stuff, if you load them up with many megabytes of random-access memory, a big hard drive and a mouse. That starts to get expensive and heavy.

The weekend computer warrior wants to run the same stuff at home as he does at the office, in the same way and with the same add-in cards. Owning two identical machines costs too much.

That's where a luggable fits in. All you need to do is haul the machine from the office to your car to your house and back again. Most Americans can do this with 30 pounds. We know your fingers are strong from keystroking. Now your biceps can be in tone, too.

When IBM introduced the Model 70 portable, it took a lot of flack for its size, weight and lack of battery power. Call me anything you like, but I believe the machine is a step in the right direction, although it is still not big enough. It comes with enough RAM and disk space to handle OS/2, and it's fast! All I'd ask for is a better display and a bunch of slots. I'd handle the extra pounds to have one machine for home and the office. On the road, why, I'd have a cheesy little laptop, of course.

Speaking of laptops and price tags, some people just have to have the best. For a car, only a BMW will do. For liquor, it's top shelf or nothing. And if a laptop doesn't have an Intel 80386, IBM Video Graphics Array-compatible display and fast disk drive, why, it just won't do.

I drive an '85 Ford Escort, like Budweiser and am more than satisfied with a $1,000 single-floppy laptop such as the Tandy 1100FD I've been lugging around. There are clearly some special considerations when using the FD. It's not backlit, so make sure to use it near a lamp. It can't handle bit-mapped graphics, so don't try to run Microsoft Windows. It's only an Intel 8088, so don't even think about OS/2 or 1-2-3 Release 3.0. And don't rush. After all, this is not exactly a scorcher.

Hey, that's my kind of machine!

It's not that fancy laptops aren't swell things. They're great. But how many people feel comfortable lugging $5,000 around, forgetting it in cabs and checking it on airplanes? You wouldn't leave $5,000 on the bed of a cheap hotel room. Why do it with your laptop?

CALL ME ANYTHING you like, but I believe [IBM's Model 70 portable] is a step in the right direction, although it is still not big enough.

The Tandy 1100FD is a no-worries machine. It has only a floppy, so crashes aren't a problem. Its battery tends to last quite a bit longer than fancy, hard-disk-laden machines. Best of all, you won't get fired for losing one.

It's also a great machine for stupid people. Tandy engineers have built DOS and the semigraphical Deskmate interface into read-only memory, so it is always ready and easy to get at. You've got what passes for word processing, an address book and a calendar. Also, most of DOS is hidden away. It's a truly minimalist machine.

If you need to run complex applications while on the road, the FD is the wrong machine. However, if all you do is write and communicate and do simple things with small sets of data, a fast, expensive laptop is overkill.

A capable, if unexciting, machine like the 1100FD may get a few more people into the laptop market. And it may just be the perfect machine for the high-end user who just had his machine stolen.

Barney is editor in chief of *Amiga World.*

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IBM finances rival's sales

BY RANDAL JACKSON
SPECIAL TO CW

AUCKLAND, New Zealand — Would IBM provide financing for a user to purchase a rival firm's computer? It has happened recently — and more than once.

Graphics and animation firm Guerrilla Pictures recently purchased a Compaq Computer Corp. Systempro, and IBM New Zealand Credit came up with the financing — the second time it has done such a deal.

"Our basic philosophy in business is to support the sale of IBM equipment, but where there is an element of IBM, we will look at funding other equipment," IBM Credit spokesman Mike Moody said.

As part of its expansion, Guerrilla Pictures has also purchased an IBM Personal System/2 for its accounting department and an IBM 4019 laser printer. All told, the graphic arts firm has spent about $171,000 to upgrade its business from three Commodore Business Machines, Inc. Amigas.

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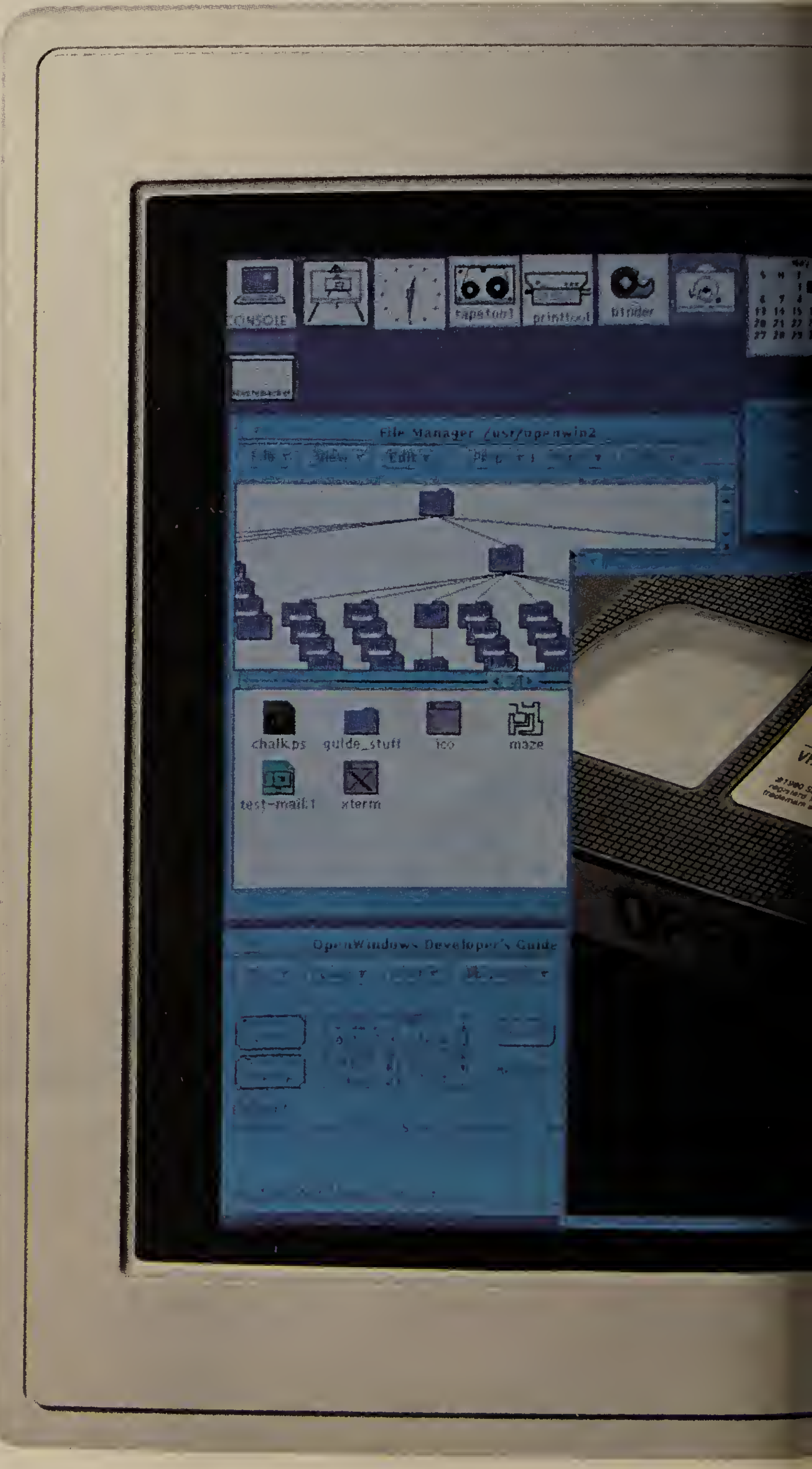

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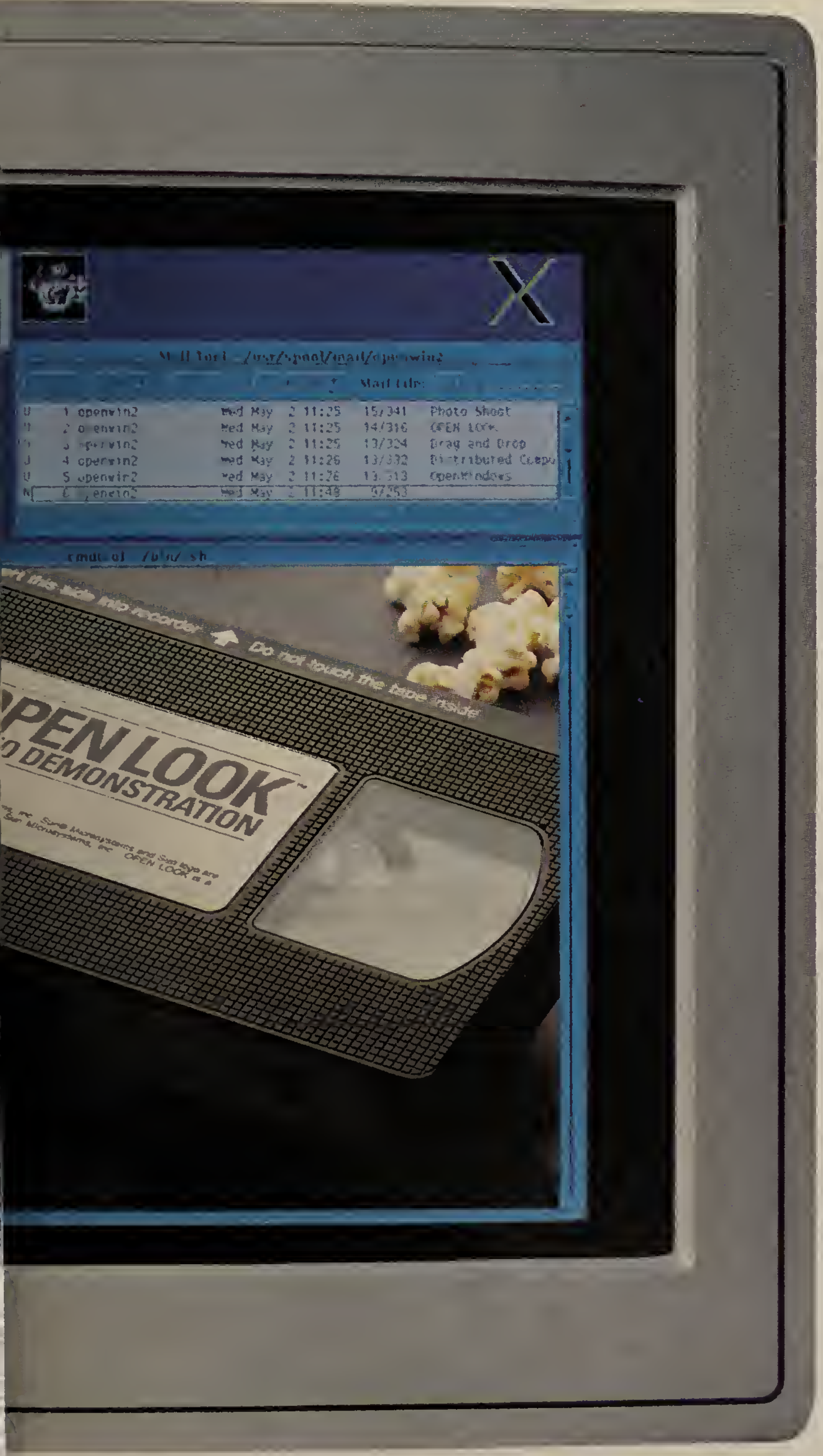

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NEW PRODUCTS

Macintosh products

Microcom, Inc.'s Software Division has updated its Virex antivirus software package to protect Apple Computer, Inc. Macintosh data files from two Trojan horse programs.

Version 2.5 was designed to combat both the Mosaic and the Fontfinder viruses that first appeared on a public domain bulletin board in Edmonton, Alberta, according to the company.

Registered Virex users can purchase single updates for $15 or subscribe to Microcom's Annual Update Service for $75.

The suggested retail price of Virex is $100.

Microcom
P.O. Box 51816
Durham, N.C. 27717
919-490-1277

Claris Corp. has announced the Macproject II trial kit, an evaluation package for Macproject II, a project management software package for users of Apple Computer, Inc. Macintosh personal computers.

The kit includes a videotape describing project management concepts and introducing Macproject II's salient features, as well as a demonstration version of Macproject II software — a hands-on, step-by-step guide for Macproject II.

The suggested retail price is $25. A $25 rebate is also being offered for purchases of the full Macproject II package.

Claris
Box 58168
5201 Patrick Henry Drive
Santa Clara, Calif. 95052
408-987-7000

Software applications packages

Software Security, Inc. (SSI) has announced Activator/S, a software protection system that can be installed without programming.

The system works with SSI's programmable software protection device, and since it does not require addition or changes to a program's code, both nontechnical users and software developers can add protection to their files. Activator/S can prevent the spreading of viruses by providing a "shell" around executable programs; once shelled, an application will not be able to run if code has been altered, the vendor said.

The product sells in quantities of 100 for $33 each.

SSI
1011 High Ridge Road
Stamford, Conn. 06905
203-329-8870

Levenbach Associates, Inc. has announced a tool kit that contains 23 models for business forecasting.

The Spreadsheet Forecaster consists of templates that work with Lotus Development Corp.'s 1-2-3 Release 2.01 or higher and compatible software packages. Each model comes equipped with sample data, a preset graph and step-by-step intructions.

The product can run on an IBM Personal Computer XT, AT or Personal System/2 and compatibles. It is available for $79.

Levenbach Associates
Suite 348
103 Washington St.
Morristown, N.J. 07960
201-285-9248

Board-level devices

KMW Systems Corp. has announced an intelligent board-level interface for linking IBM or plug-compatible mainframe channels to the Motorola, Inc. VMEbus.

The Channelaxcess 9400 VMEbus interface features built-in software that provides IBM control unit emulations, which enable the unit to be configured at an IBM site without host software modifications, the vendor said. It uses a Motorola 68020 CPU to provide data streaming transfer rates of 2M, 3M or 4.5M byte/sec.

Preproduction units of the product have been available since February, and full production versions are scheduled to begin shipping this month for $7,500 per unit.

KMW
6034 W. Courtyard Drive
Austin, Texas 78730
512-338-3000

Development tools

Liant Software Corp. has announced programming languages and software development products for IBM's RISC System/6000 workstations running the AIX operating system.

The products include RM/Cobol-85 Compiler ($1,800) and RM/Cobol-85 Runtime System ($400), which allow more than 500 applications that have been written in RM/Cobol-85 to be available for users of RS/6000s; LPI-Fortran ($1,095), which offers Digital Equipment Corp. VAX Fortran extensions to facilitate conversion; LPI-Fortran Runtime Environment ($400); and Codewatch ($795), an interactive source-level debugger.

Liant Software
959 Concord St.
Framingham, Mass. 01701
508-626-0006

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SPARC ware

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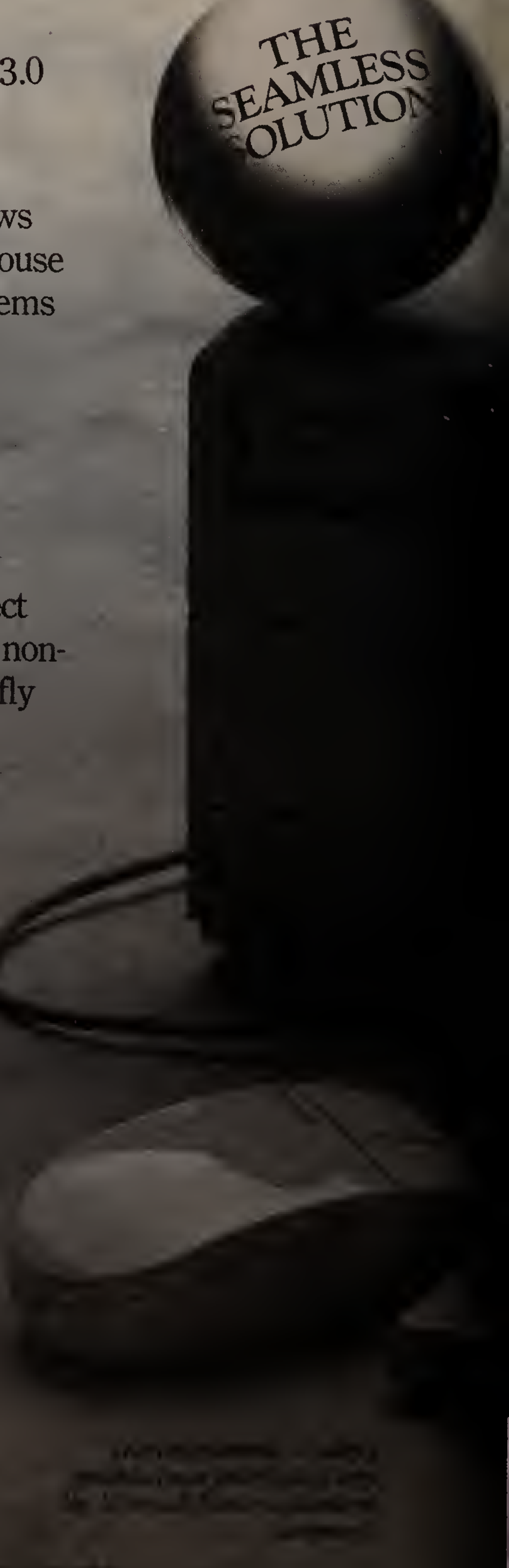

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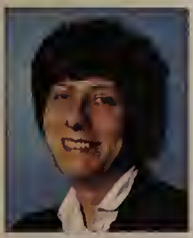
DATA STREAM

Elisabeth Horwitt

Stale standards?



We industry watchers are always on the lookout for those magical, watershed times when a technology or product or standard finally comes into its own, after languishing for months or even years in a sort of limbo, waiting for sufficient user demand and industry support to bring it to life.

However, when — as in the case of Integrated Services Digital Network (ISDN) and Open Systems Interconnect — a standard has languished on the shelf for many years, you begin to wonder whether it is lying fallow or simply rotting. How long a shelf life does a standard have, anyway?

Some industry analysts are saying that ISDN is moribund, even before it has really had a chance to enjoy life as a viable telecommunications protocol. They point out that the current protocol only supports speeds of up to 1.5M bit/sec., while users are now looking beyond ISDN to broadband ISDN and other emerging technologies that will support speeds of 100M bit/sec. or more, and that can handle demanding data commu-

Continued on page 60

Tracking freight ship-to-shore

ON SITE

BY JOANIE M. WEXLER
CW STAFF

TOKYO — Businesses shipping their wares around the globe tend to do more than just trust that their goods will stay on track after the freighter bobs out of sight over the horizon.

Most customers of K Line, an international shipping firm owned by Kawasaki Kisen Kaisha Ltd., demand continuous updates on the status of their shipments, according to Tadahisa Matsuda, general manager of the information development division of K Line.

To accommodate that demand and the broadening of its service to inland destinations and additional ports, K Line began installing a global T1 backbone in January with equipment from Cherry Hill, N.J.-based Infotron Systems Corp. The network, which is nearly 90% complete, integrates voice, data, telex and facsimile traffic.

North American K Line customers can connect into a Cranford, N.J., computer center from their terminals via the Tymnet value-added network for up-to-date shipment information, according to Thomas Marino, vice-president of MCC Corp. in San Francisco, the North American computer operations arm of K Line.

Previously, K Line used multipoint data circuits feeding the Cranford site, low-speed circuits to another computer center in San Francisco for telex and separate tie lines for voice. The Far East ran a separate private network, but most voice traveled over the public switched network — an expensive setup.

One goal with the new network is to save 50% on voice charges, which should allow the shipper to recoup its $3.5 million T1 investment in five years, according to Matsuda and Marino.

The company strategically designed the network's North American segment in a ring configuration for redundancy, with full T1s linking Infotron NX3200 multiplexers in New York, Chicago, San Francisco, Long Beach, Calif., Houston and Atlanta and two dedicated 56K bit/sec. circuits linking New York and Atlanta. Two 56K bit/sec. channels connect New York and Toronto, and full T1s link San Francisco to Seattle and San Rafael, Calif.

All links are leased from MCI Communications Corp., which is also the company's long-distance carrier.

A 256K bit/sec. fractional T1 link over trans-Pacific fiber cable from consortium International Digital Communications Co. serves as the San Francisco-Tokyo gateway. Offshore nodes are or will soon be networked over 64K bit/sec. multiple T1 lines in Hong Kong, Taiwan, Singapore, Korea and Thailand. Next year, K Line will be expanding the Infotron network to Europe.

The NX3200s automatically reroute data and telex traffic, while AT&T System 85 private branch exchanges at the main node sites are programmed to transfer voice traffic to the public switched network in the event

Continued on page 57

FEATURE: NETWORK MANAGEMENT

Personality plus the network

BY MICHAEL HURWICZ
SPECIAL TO CW

"The personality of the company," according to Ray Thomas, manager of office automation at Hadson Corp., "is going to dictate how you manage your network."

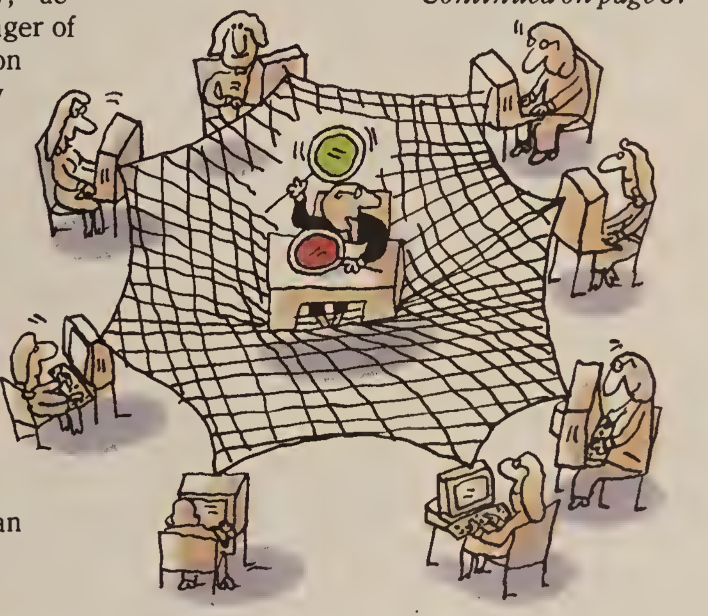
Personality, you ask? You bet.

Because network management is a people-intensive function, a company's policies for managing people are likely to have a decisive effect on network management strategies, IS managers and consultants say.

Company policy may tend to push network management out to the work group, back to the data center or out to third parties.

"You don't parachute technology into an organization without changing the organization," says David Passmore, a partner with the network strategies practice at Ernst & Young in

Continued on page 57



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Hurwicz is a free-lance technology writer based in Eastsound, Wash.

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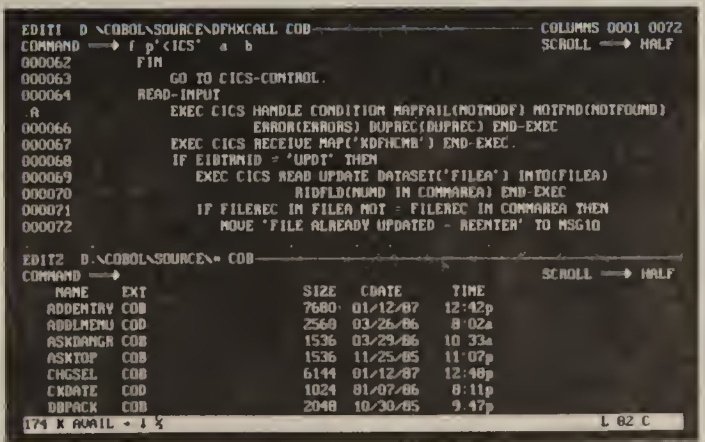

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EDIT1  D \COBOL\SOURCE\DFHXCALL COD---------------------------- COLUMNS 0001 0072
COMMAND ──→ f p'<ICS'  a  b                                   SCROLL ──→ HALF
000062         FIN
000063             GO TO CICS-CONTROL.
000064         READ-INPUT
.A                 EXEC CICS HANDLE CONDITION MAPFAIL(NOTMODF) NOTFND(NOTFOUND)
000066                       ERROR(ERRORS) DUPREC(DUPREC) END-EXEC
000067             EXEC CICS RECEIVE MAP('XDFHCMB') END-EXEC.
000068             IF EIBTRNID = 'UPDT' THEN
000069                EXEC CICS READ UPDATE DATASET('FILEA') INTO(FILEA)
000070                          RIDFLD(NUMB IN COMMAREA) END-EXEC
000071                IF FILEREC IN FILEA NOT = FILEREC IN COMMAREA THEN
000072                   MOVE 'FILE ALREADY UPDATED - REENTER' TO MSG10

EDIT2  D:\COBOL\SOURCE\* COB------------------------------------------------------
COMMAND ──→                                                   SCROLL ──→ HALF
   NAME     EXT                          SIZE   CDATE      TIME
   ADDENTRY COB                          7680  01/12/87   12:42p
   ADDLMENU COD                          2560  03/26/86    8:02a
   ASKDAMGR COB                          1536  03/29/86   10:33a
   ASKTOP   COB                          1536  11/25/85   11:07p
   CHGSEL   COB                          6144  01/12/87   12:48p
   CKDATE   COD                          1024  01/07/86    8:11p
   DBPACK   COB                          2048  10/30/85    9:47p
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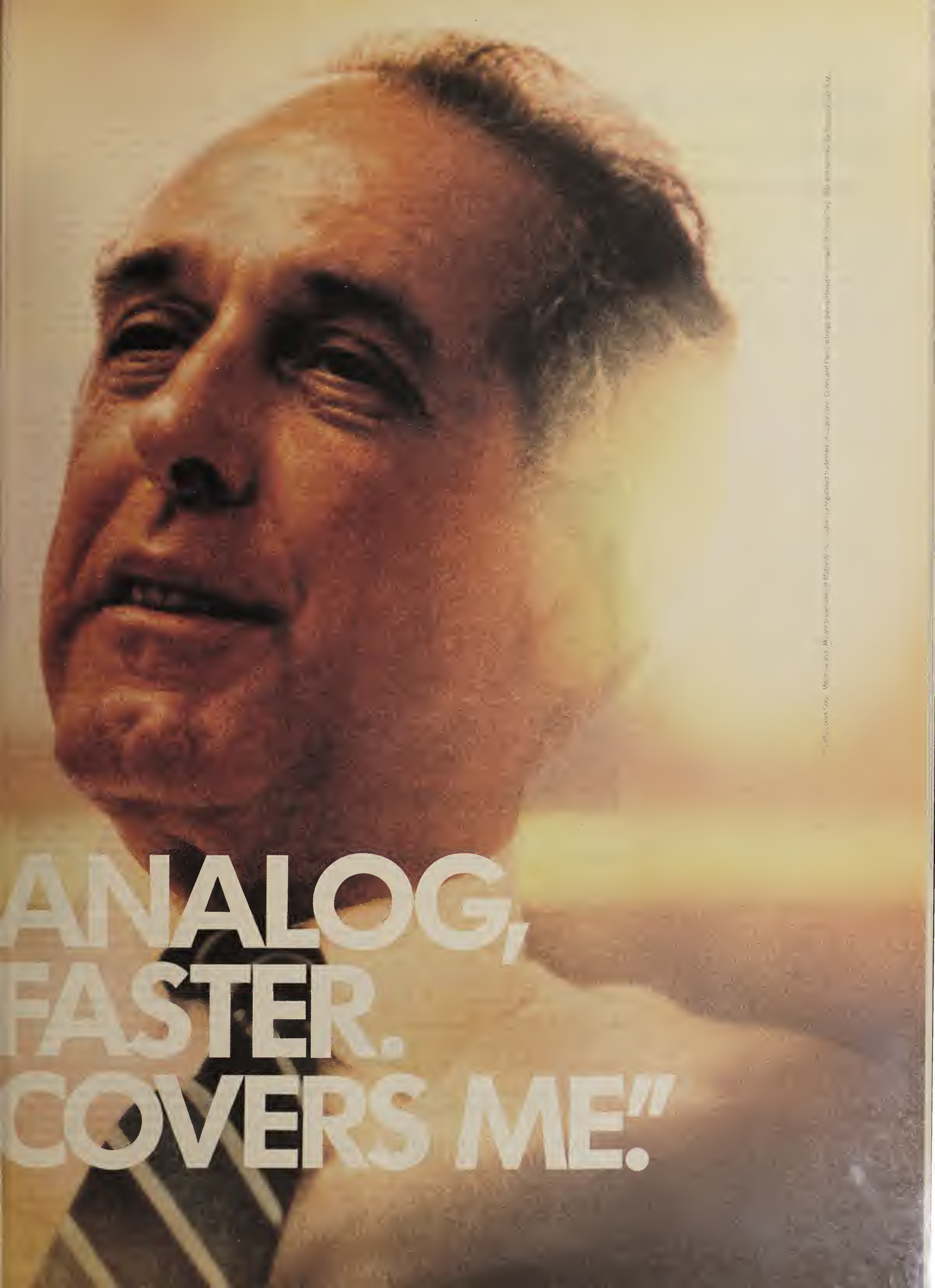
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Networking at Sears means centralized — not inflexible

ON SITE

BY ELLIS BOOKER
CW STAFF

CHICAGO — Six months into the new year finds the massive data center consolidation plan at Sears, Roebuck and Co. on track.

Bucking the general trend toward dispersed data processing muscle and distributed systems, the Sears plan instead calls for a reduction of data centers, from nine last year to three centers networked over 45M bit/sec. lines.

However, centralization is not a euphemism for inflexibility, according to Gary Weis, senior vice-president of networking and technology services at Sears Technology Services, Inc. (STS).

Weis said he envisions a networked data processing environment that will allow him to mix and match the three centers as needed, distributing mainframe processing cycles and even mass storage for the same job across the current six hosts in each center and, eventually, among hosts across the three centers.

Weis added that this capability is in the wings: "We've migrated applications to the data centers, and now we want to dynamically move them around machines." He said he expects this second phase to occur in the next 15 to 18 months.

The limiting factor, he said, is current connectivity options for the IBM 3090 series.

However, if Sears wants this capability from IBM, odds are it will get it, if anyone can. Sears is believed to have the world's largest centrally managed Systems Network Architecture (SNA) network and is quite possibly IBM's biggest hardware consumer.

Sears' Weis

While Weis is a booster for Netview as IBM's long-term network management approach, even he has not always followed IBM's lead. For example, Sears developed its own interface between Netview and about 2,000 IBM Series/1 computers, which garner alarm data from a plethora of non-IBM gear. Weis said that at the time developing the interface in-house meant avoiding the cost of buying hundreds of Netview/PC workstations.

The three data centers — in Columbus, Ohio, Schaumburg, Ill., and Dallas — will be connected by dual 45M bit/sec. DS3 links.

With its high transmission capacity, the network will be capable of tape backup at tape-channel speeds. This will allow, for example, backup to occur in one center while processing occurs in another. "Basically, this will eliminate off-site storage," Weis said.

In the later half of this decade, Weis wants to be able to manage his three centers as a single, homogeneous system.

"This would imply that a disk controller would be able to use a 100M bit/sec. network interconnection to access programs running in another center, without having to move the whole file back and forth," Weis explained, adding that such a capability sounds like *Star Wars* today but, "based on conversations with several vendors, we think it will be available . . . and we're trying to position ourselves," he said.

Why three centers and not one megacenter? Weis acknowledged that this approach was considered but rejected in light of disaster recovery and security concerns. "We didn't want to hire an army with submachine guns to guard the place," he quipped.

Three-tiered protection

For now, there will be three levels of data protection in the event of outages. For mission-critical applications, the goal will be to restore operations in one hour, a second category of applications within 24 hours and a third within 30 days.

Weis also noted that the number of nodes on Sear's network is growing rapidly, from 10,550 last year to 17,250 this year, and that the firm's local-area networks (there are 500 IBM Token-Ring networks now) will see rapid increases.

Formed in January, the STS subsidiary of $54 billion Sears is an umbrella organization, managing the networking and data processing needs of Sears subsidiaries: Sears Merchandise Group, Coldwell Banker Real Estate Group and Dean Witter Financial Services Group. Allstate Insurance Group also relies on STS but is pursuing its own data processing agenda.

Weis defined STS' role as that of creating general computing and network capabilities, which the operating units can then use at their discretion. "The real efficiencies come from a common infrastructure," he said.

Sears will spend $225 million this year on processing capabilities. It will spend another $200 million on data communications, some $126.2 million of which will go toward SNA services.

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Personality

FROM PAGE 53

Fairfax, Va. "In many ways, the organization of network management will mirror the organization of people."

If business units within a company are largely autonomous, they will probably be autonomous as far as network management goes, too. On the other hand, a highly centralized company will tend to exert a high degree of central control over the network, according to Thomas.

Thomas has had it both ways: Hadson's "personality" has gone from highly centralized to more decentralized as the Oklahoma City-based natural gas company considers selling many of its business units, he says.

For example, Hadson is selling its Irvine, Calif., office and has, therefore, given Irvine management a high degree of autonomy. Network management has also gone from being centralized to being handled on-site.

Network management follows business relationships, even when the base technology stays the same, Thomas notes. The Irvine office has Hewlett-Packard Co. HP 3000 minicomputers and microcomputer local-area networks linked by X.25 and T1 networks.

Image-conscious

For Metropolitan Life Insurance Co. in New York, presenting a single-company image to its customers while retaining a decentralized business management structure has meant a move to a more centralized network management strategy. Met Life has multiple decentralized lines of business, such as personal insurance, group insurance and property and casualty insurance. One group's applications have essentially no overlap with other groups' applications. Different groups' applications also tend to reside on different mainframes.

Technology has followed this business orientation. Processing is distributed among several computer centers, and day-to-day management, both of people and networks, is decentralized among those locations. In addition, LANs are growing apace.

Presenting a unified company image to customers, however, means allowing all groups to access all mainframes and mainframe applications. To make this convenient, access is transparent for Met Life end users; they don't have to know which mainframe they're accessing or how the network gets them there.

Such a setup needs strong central coordination, network management and support. "When problems arise," says Steve Bortnyk, Met Life's manager of data communications, "there has to be a support staff that supports the system as a whole, not just part of it."

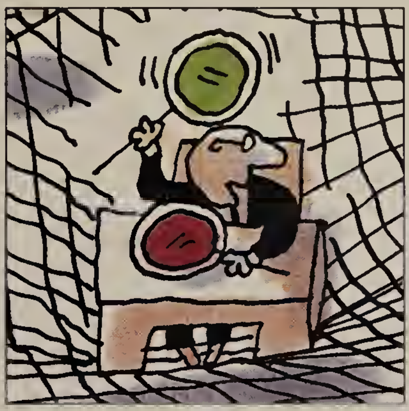
The need for a central management group that can see the big picture is growing more acute in most organizations, Passmore says. This group's charter is to form cohesive networks that reflect management's mandate to run a more tightly coordinated company.

Local administrators may not have the experience, training or tools to handle emerging technological challenges such as mainframe access, LAN-to-WAN connections or client/server environments, Passmore says.

People that can handle these jobs are expensive, he adds, so "economics dictates that you hire as few as possible and leverage that capability as much as possible." A strong central management and support group enables companies to do just that.

One problem with centralized management of complex networks, however, is that the central group is bombarded with huge quantities of alerts, alarms and messages from many different kinds of systems. This is driving companies toward integrated network management systems, such as IBM's Netview, AT&T's Accumaster Integrator and HP's Openview, which can help filter and correlate these messages, Passmore says.

Met Life, for instance, is currently using Netview and considering Accumaster Integrator. The two would be used together — Netview to manage IBM Systems Network Architecture equipment and functions and Accumaster for telecommunications equipment and functions.



Today, however, integrated management products mainly filter, discard routine messages and allow the user to set thresholds that indicate when a particular problem is getting serious, Passmore says. Message correlation — the ability of software to pinpoint a single problem based on multiple alerts — is still largely an unsolved problem. Eventually, expert systems will take over much of this intelligent guesswork and allow companies to get by with fewer or less highly trained support people. For now, a central support team with an in-depth understanding of the network is required to interpret multiple messages and make intelligent guesses about the probable cause of problems.

Another difficulty with the centralized approach is that individual locations may lack the skills to manage independently if necessary, Passmore says, especially if the location is divested.

Hadson came across this problem when it began preparing to divest itself of certain firms, Thomas says. As the company broke up into autonomous units, it found that while the local staff could keep systems going, that same staff did not have the skills to grow the system or make major changes. This problem may be resolved over time through training or through central support expertise brought in by an acquiring firm.

Another issue with centralized management is simply the expense of employing the necessary people and buying the required tools.

"It's difficult to find people with the right skill sets," Passmore says. "You may find somebody who is good at WANs or LANs, but it's hard to find someone who can handle both." The trend is toward "system-smart" network support personnel who can converge traditional network management with systems management, according to Passmore. But someone who can handle both can be expensive.

To outsource — or not

One way of controlling this expense while gaining needed skills is by outsourcing — contracting with an outside vendor to supply network management services.

At Merrill Lynch & Co., the New York financial services firm, the central IS group makes decisions about directions for strategic applications, says Bruce Turkstra, senior vice-president of global information services. "But there is still a lot of infrastructure support that can be acquired more cost-effectively from vendors, because they have a larger base to write things off over."

For instance, he says, IBM is developing network management software for Merrill that will allow integration of alarm systems from multiple vendors, allowing the alarms to be viewed from a single console at the help desk. IBM can sell this software to hundreds of clients, Turkstra says, so they don't have to charge Merrill the full cost of developing it.

Either/or

Outsourcing boils down to a simple "make or buy" decision, Turkstra says. If you can buy network management more inexpensively than you can do it yourself, it makes sense to outsource. Merrill Lynch is now also using MCI Communications Corp. to perform a number of functions the firm used to do for itself, such as ordering, provisioning and network design, he added. One piece Merrill has not outsourced is the management of network support personnel. There is a strong impetus toward centralized management in order to leverage the skills of support personnel.

However, outsourcing is not the answer for everyone, Passmore says. Many firms use the network to gain some sort of competitive advantage and therefore employ state-of-the-art technology. Third-party service providers may not yet have such technical knowledge, Passmore says. In addition, systems have to be fairly stable to be handed over successfully to a third party; they can't be changing constantly or on the "bleeding edge" of technology, he says.

Many firms are attracted to outsourcing, which allows skills to be leveraged even further by centralizing support functions for several firms in a single service provider. However, the business purpose of the network and the corporate culture it serves often remain overriding considerations. After all, network management that doesn't serve business goals is no savings, no matter how cheaply it may be purchased.

K Line

FROM PAGE 53

of an outage.

The Asian and North American network segments are being managed separately because of time zone differences.

Different strokes . . .

Infotron's Integrated Network Manager, which is a graphics-based system that runs on a workstation from Hewlett-Packard Co.'s Apollo division, has been installed in both the San Francisco and Cranford data centers, while an Advanced Network Manager runs on an IBM Personal Computer AT in Tokyo.

Two different products are being used, according to Marino, because the Integrated Network Manager requires the extra bandwidth afforded by the North American full T1 network to pinpoint reroutes.

"The network management system shows us a color map of North America with all our nodes and links. We click a mouse on a city and bingo — we know what alarms are occurring. We can also gather error statistics," Marino explained.

Marino noted one ironic drawback of the Infotron equipment: "It's so flexible that it's quite complicated," so users have to be extremely educated about the system, and thus installation has a tendency to go slowly.

One major impetus for the new network was to improve on the overall quality of voice service, Marino said.

"We're doing voice compression, and nobody knows the difference," Marino said. "In fact, the compression removes some background noise, so transmissions actually sound better."

While it is possible to compress voice to 16K bit/sec. with the NX3200, K Line is staying at 32K bit/sec. for the time being.

"We got a bad taste for voice compression when we digitized voice over satellite from San Francisco to Tokyo," Marino explained.

"The digitizers would often cause echoing — once I actually answered my own question!" he said. "Now, people ask, 'Gee, are you in town?' when I'm halfway around the world."

Fax fix for time barrier

Facsimile plays an important communications role in the global shipping business, because time zone barriers don't allow overseas colleagues much overlap time at the office. With K Line's new T1 backbone network, fax machines can dial into a Panasonic Co. Panamail computer in the San Francisco data center configured with 10 North American lines and one digital line to Tokyo to broadcast faxes throughout the global T1 network.

Users send a fax into Panamail along with a cover sheet with little boxes "like those you fill in with a pencil when taking a test," explained Thomas Marino, vice-president of MCC Corp., the North American computer operations arm of Tokyo-based K Line. The boxes represent the names of the different cities accessible by fax, and Panamail matches the designated destinations to a database of phone numbers to send multiple copies of the same fax.

K Line is a heavy fax user because of its large volume of documents. The documents are faxed to the San Rafael, Calif., center for document entry and are remotely entered into Memorex Telex terminals and sent to an IBM 4381 mainframe.

JOANIE M. WEXLER

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Horwitt

CONTINUED FROM PAGE 53

nications applications such as LAN-to-LAN links.

In addition, vendors are sending users mixed messages about their commitment to ISDN by introducing services that provide a lot of the benefits that ISDN promises, but without requiring that users implement the telecommunications standard.

For example, an increasingly hot application combines automatic number identification with computer-to-private branch exchange interfaces. Such a configuration delivers key information about a caller — such as account history or product preference — to the screens of telemarketers and service representatives, just as they pick up the telephone.

However, the vendors have muddied the waters by announcing products that link computers and switches and deliver number identifications without the need for ISDN. This could deprive ISDN of a potential "killer application" to bring users aboard en masse.

The real question is when and how ISDN can generate enough market mass to reassure recalcitrant vendors (particularly local carriers) and dubious users of ISDN's long-term viability. One analyst estimates that about 120 companies use ISDN now, including pilots. This is not critical mass.

Pessimists deny the likelihood that demand is about to explode, pointing out that large service companies — the pioneers in networking — don't need ISDN because they already obtained the flexibility and cost benefits ISDN promises by installing private T1 networks and striking multiyear deals with the carriers.

Before we start singing a dirge to ISDN, however, let's look at evidence to the contrary.

Where early ISDN applications tended to be strictly ho-hum, companies such as American Express, Hardee's, Schindler Elevator and Matrixx Marketing have recently demonstrated how the technology can provide a competitive edge, particularly in the service area.

Furthermore, companies such as Shearson Lehman, Young & Rubicam and Manufacturers Hanover have signed up for a New York Telephone trial to explore which ISDN applications work for them.

The full benefits of ISDN are, if not around the corner, at least coming along faster now. Vendors are testing cross-switch and cross-carrier interoperability.

Perhaps most importantly, users have not dismissed the standard. While respondents to recent surveys have said that ISDN has little significance to their companies over the short term, many have indicated the likelihood of its playing a major role in a few years.

Given all this, I would say reports of ISDN's demise are definitely premature.

Horwitt is a *Computerworld* senior editor, networking.

Bank enters EDI/EFT ring

BY JIM NASH
CW STAFF

DETROIT — NBD Bank NA is quietly positioning itself as an intermediary among banks that are reluctant to involve themselves in electronic funds transfer (EFT) and electronic data interchange (EDI).

The Detroit-based bank is in the process of closing service contracts with three or four of its correspondent banks, according to Peter Stein, first vice-president and manager of NBD's corporate cash management program. Through the contracts, NBD will operate as a value-added network of sorts for other banks.

Known as NBD's Electronic Payment Receiving Service, the network will handle funds transfer and data interchange between a bank's corporate customers. Stein said the service is not the first of its kind, but it should help speed acceptance of electronic payments.

"The corporate world asks, 'Why should I do [EDI] when none of the banks do it?' Banks, on the other hand, can't justify the cost of EFT or EDI," he said.

"Usually, the only incentive for a bank to offer EFT and EDI services is to protect and preserve their corporate relationships" that demand electronic payment, Stein said. Programs such as NBD's offer banks the opportunity to do that without investing heavily in EFT and EDI, he said.

Stein declined to say how much the service will cost correspondent banks, saying only that a flat monthly fee and a set of variable charges will be levied. He said total charges could be measured "in the hundreds, not the thousands" of dollars.

The service will put NBD in direct competition with value-added networks, such as General Electric Information Services, that electronically transmit transaction data only, usually between two bank clients. It differs in that it is aimed at banks themselves and that it involves the transfer of transaction data and funds.

NBD, formerly National Bank of Detroit, was one of the original eight banks that participated in the ground-breaking General Motors Corp. EDI network in the 1980s. It currently offers the service to sister banks owned by its parent, NBD Bancorp.

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Vendors enhance private nets

BY ELLIS BOOKER
CW STAFF

NEW ORLEANS — During a conference at which issues of private networks vs. public networks continued to arise, equipment vendors offered numerous enhancements to their private networking systems during the recent International Communications Association gathering.

Those announcements included the following:

- Hughes Network Systems said it had enhanced its Personal Earth Station very small-aperture terminal (VSAT) with a graphical network management system. Called Illuminet, the system, which uses a Digital Equipment Corp. VAX as its system control processor, is based on Open Systems Interconnect standards and employs the X Window System protocol, according to Hughes. It hopes to have the network management package ready by August. Hughes also said that it would prepare a frame-relay interface for its packet switch.
- Contel ASC in Rockville, Md., said it would target the low end of the market with its latest offering, a 9.6K bit/sec. VSAT service available in 50 metropolitan areas. DMS 2000, a virtual hubbing service for VSAT networks, can be had for $295 per month per node, along with a $1,800 per node installation fee. The monthly fee includes the lease of the VSAT, satellite transmission facilities and maintenance services.
- For terrestrial line applications, Netrix Corp. in Herndon, Va., introduced a packet switch featuring X.25 packet switching, circuit switching, subrate multiplexing and T1 multiplexing. A frame-relay interface will be added to the #1-ISS Integrated Switching System early next year, Netrix said.
- AT&T Tridom said it was offering the first in a family of industry-tailored VSATs. The field-hardened Scada-sat, which is suitable for hostile environments, will be available at the end of the year and is already being used by one pipeline company, AT&T said. AT&T said it plans to have three other vertical-market VSATs by the end of next year.
- AT&T Paradyne introduced several new products under its Comsphere networking architecture, which was introduced in January to provide a common network management system and framework for AT&T and Paradyne modems and digital service units.

The Comsphere 3600 series is said to be the first digital service unit to support multichannel, multidrop communications. The product "consolidates up to six independent applications that would otherwise have to go on different circuits" onto a single multipoint multichannel Digital Dataphone Service facility, an AT&T spokesman said.

NET BITS

Price cuts for LAN adapters

Western Digital Corp. has reduced the price of its Ethernet local-area network adapters and extended the one-year warranty on these and other cards to five years. The company's 8-bit Ethercard Plus has been reduced in price from $349 to $249, and the 16-bit Ethercard Plus16 has been lowered from $399 to $349.

Now standard in all **Cisco Systems, Inc.** routers is a dynamic routing protocol that lets users build Open Systems Interconnect (OSI)-based computer networks. Cisco's protocol is said to temporarily fill in the OSI routing protocol gap until about mid-1991, when that standard is expected to be finalized.

Spectrum Concepts, Inc. has announced a third-party agreement with **Stratus Computer, Inc.** under which Spectrum's Xcom 6.2 communications software will be made available on Stratus XA 2000 continuous processing systems. The match is expected to allow Stratus' fault-tolerant computers to share data over LU6.2 links with a range of other systems.

Belgium's telecommunications authority and **TRT/FTC Communications, Inc.**, an international subsidiary of **Pacific Telecom, Inc.**, said that they are about to close an agreement to offer bandwidth-on-demand dial-up transmission service between the U.S. and Belgium.

Additional customer support for users of **Ungermann-Bass, Inc.'s** Net/One enterprise networking software has been made available through the company's new Partnership program — offering shared hardware backup and on-site software support — and the Elite program, which provides on-site engineering support and monthly activity reports, the company said.

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NEW PRODUCTS

Local-area networking hardware

3Com Corp. has announced two communications servers that support industry-standard networking protocols.

The CS/2000 and CS/2100 can connect up to 10 terminals, personal computers, modems or printers to a local-area network. The servers offer support for Transmission Control Protocol/Internet Protocol, Xerox Network Systems and Open Systems Interconnect. Both products offer access control and conditional macros.

The CS/2000 and CS/2100 cost $2,800 and $3,300, respectively.

3Com
3165 Kifer Road
Santa Clara, Calif. 95052
408-562-6400

Dukane Corp.'s Network Integration Division has unveiled Trilan, a multimedia local-area network that integrates voice, data and video at the desktop.

The 16M bit/sec. system simultaneously integrates telephone call processing, data-oriented computing and video over one wire or fiber-optic cable. Each personal computer on the network supports a digital telephone. The LAN also accommodates still-frame imaging, video monitoring and two-way interactive video, the vendor said.

An eight- to 12-user system costs between $15,000 and $20,000.

Dukane
2900 Dukane Drive
St. Charles, Ill. 60174
708-584-2300

Local-area networking software

Simultaneous use of three protocols on the DOS desktop is reportedly provided by Prolinc software from Hughes LAN Systems.

Prolinc users do not have to reboot their systems to load or unload such protocols as Novell, Inc.'s Interpacket Exchange, Digital Equipment Corp.'s Local Area Transport, Transmission Control Protocol/Internet Protocol and Sun Microsystems, Inc.'s Network File System.

Users also have the capability to transfer data among dissimilar hosts and network server systems.

The software supports multiple types of network adapters over multiple media. Support for third-party terminal emulators and file transfer protocols is also included in the $595 package.

Hughes LAN Systems
1225 Charleston Road
Mountain View, Calif. 94043
415-966-7300

Network management

Fresh Technology Group has announced the release of a menu-driven graphical network analysis tool that enables authorized Novell, Inc. Netware users to monitor usage, efficiency and performance of a Novell network in real time or during user-specified time frames.

Netvision acquires network performance data by real-time sampling, short-term time-lapse sampling and long-term value-added processing sampling.

Netvision requires a workstation that runs Netware Version 2.0 and is equipped with 450K bytes of memory. The product is available for $495.

Fresh Technology
1478 N. Tech Blvd.
Gilbert, Ariz. 85234
602-497-4200

Pharos Technologies, Inc. has announced Statusmac Version 1.0, a network management software package designed for managers of Apple Computer, Inc. Macintosh networks.

The product operates with Microsoft Corp.'s Microsoft Mail Version 2.0 and uses the latter product's store-and-forward programmable forms technology to allow data to be imported via a network. A Portable Profiler application enables users to access Macintosh users who are unable to be reached via Microsoft Mail.

A basic package is scheduled to be available early next month. The price of a 10-profile package is $800; upgrades are available in 10-profile units for $600.

Pharos
4243 Hunt Road
Cincinnati, Ohio 45242
513-984-9273

Gateways, bridges, routers

Solana Electronics has announced a router/bridge designed for Apple Computer, Inc. Appletalk networks.

The ISDN H-Server incorporates an Integrated Services Digital Network (ISDN) terminal adapter and provides a direct link to an ISDN Basic Rate Interface line. The product uses one 64K bit/sec. digital B channel to provide links with Appletalk users in distant locations. Its ISDN H-Server Manager software includes a comprehensive scripting language that enables users to initiate data calls from the network, the vendor said.

ISDN H-Server is available for a price of $3,195.

Solana
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San Diego, Calif. 92117
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MANAGER'S JOURNAL

EXECUTIVE TRACK

Chet Lakhani has been appointed vice-president of information services at **AST Research, Inc.** in Irvine, Calif.

Lakhani will oversee the personal computer vendor's internal information and computer services, end-user computing, application systems development and data communications. He will report to Chief Financial Officer Bruce Edwards.

Lakhani was formerly employed by Toshiba America, Inc. in Irvine, Calif. He has also held the position of chief information officer at Smith International, Inc., in Newport Beach, Calif., and was senior director of information services at Flying Tigers Lines of Los Angeles.

He holds a bachelor's degree from the University of Poona, in Poona, India, as well as a master's degree from the University of Wisconsin at Madison and an MBA from Indiana University at Bloomington. He resides in Irvine.

……

Paul Meallo was named director of management information systems at **Wearguard Corp.** in Norwell, Mass. Meallo is responsible for applications development, computer operations and telecommunications.

Meallo was most recently vice-president of the corporate MIS department at Damon Corp. in Needham, Mass. Prior to that, he was corporate director of MIS at Sigma Instruments in Braintree, Mass. He lives in Duxbury, Mass.

……

Who's on the go?

Changing jobs? Promoting an assistant? Your peers want to know who is coming and going, and *Computerworld* wants to help by mentioning any job changes in Executive Track. When you have news about any staff changes, be sure to drop a note and photo or have your public relations department write to Clinton Wilder, Senior Editor-Management, *Computerworld*, Box 9171, 375 Cochituate Road, Framingham, Mass. 01701-9171.

IS finally gets cleared for takeoff

Management persuades Midway Airlines to take the leap into computerization

BY JIM NASH
CW STAFF

Being an underdog can be relished only in retrospect — and only when one is successful.

Take the case of Midway Airlines's Paul Tate and Robert Kohlstedt. They have literally built the company's information systems department from the ground up, despite a corporate culture that had only antipathy for systems of the electronic variety.

For six years, Tate, vice-president of IS, recommended that Chicago-based Midway invest in computer software and hardware as a way of cutting costs and ensuring safety. For six years, his advice went unheeded. He said management was positioning the small regional airline as an alternative to its larger, more bureaucratic competitors.

"Our focus . . . had been on resources such as planes, routes and terminals," Tate says. "Infrastructure, including MIS, kind of took a backseat. The watchword was 'keep it simple.' "

That dictum reached beyond the "basic transportation" image held up to the public and strongly affected management attitudes toward technology. "The original owners didn't want to see a computer on the premises," Tate says. "We really were a no-frills airline."

Kohlstedt, director of IS, explains that key tasks, such as logging "squawks" or complaints about the myriad components on each plane, were paper-based. Other tasks that required computer aid were outsourced. One example was a flight-planning program that helped cockpit crews fly more efficiently based on air conditions, cargo loads and passenger numbers.

Ralf-Finn Hestoft

Midway Airlines' *Kohlstedt had to fight an uphill battle in turning managment on to computers*

"Some of these tasks weren't too important while there was federal regulation [of aviation]," Kohlstedt says. "With deregulation, they became very important."

Tate is one of the few Midway executives who can be considered an old-timer at the decade-old airline. Originally a consultant for Midway, he was hired full time as company comptroller in 1980. Kohlstedt had previously manned IS departments in manufacturing companies. He was hired as MIS director in 1987.

In the deregulated environment, costs to Midway and prices to customers were liable to change on a daily basis. Tate felt that automation would make it easier to anticipate and react to the gyrations.

However, he was successful only in buying an IBM System/32 minicomputer and leasing some ticket-accounting software. The System/32, Tate explains, was easy to use and simple enough for a keypunch operator to maintain. Outside of that, little else in the company was automated.

Continued on page 70

Technology fairs: Step right up and see

BY ALAN J. RYAN
CW STAFF

Phineas Taylor Barnum was a big proponent of giving audiences a wide array of stimuli to hold their interest. The same basic principle can work for information systems, too, in the form of the technology fair.

Doreen Dahle

Such fairs are designed as a showcase of IS for end users — one gathering-place where new technologies and applications can be displayed and demonstrated for a day or two. Fair attendees often see technologies in a new light by visualizing how their own departments can be more innovative in their use of information after observing how others are using it.

The Travelers Corp. insurance company in Hartford, Conn., for instance, held its second annual Technology Fair last month. Nearly 300 users attended demonstrations and sessions on topics such as data processing security, bar-coding systems, teleconferencing, multimedia technology, image processing and regression testing, as well as proprietary applications of The Travelers.

The fair drew nearly twice as many attendees as it had last year, according to IS workers at The Travelers.

The fair at the $12.5 billion insurance company came about through an IS managers' forum at The Travelers that decided that a good way to build and strengthen the relationship between IS and its customers was through a public event, according to Lynette Zacchera, a systems engineer.

Other companies whose IS departments sponsor similar events include John Hancock Mutual Life Insurance Co. and Warner-Lambert Co.

Though it was set up by IS, the technology fair recruited the actual users of the systems to demonstrate the systems they are using, said Mary Devitt, a senior information team leader at The Travelers.

It is too soon to tell what the impact of this year's fair will have on the various departments within The Travelers (the results of session evaluation sheets are still being tallied), but last year's event did bring about tangible results, Zacchera said.

In its business, The Travelers uses patient advocates — a process whereby policy holders speak with a registered nurse at the insurance company prior to surgery or following diagnosis of a problem. After last year's fair, "the patient advocates jumped on OS/2 technology" and have been using it in their work, Zacchera said.

"This year, they demonstrated what they are doing using OS/2, such as running multiple sessions to pull up information for their customers without having to log in and out of various information sources," she added.

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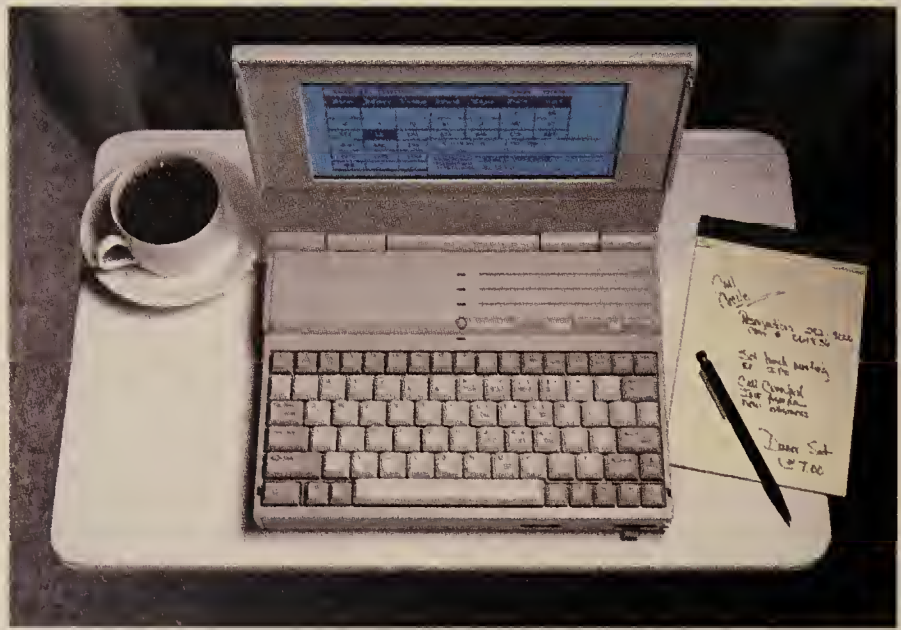
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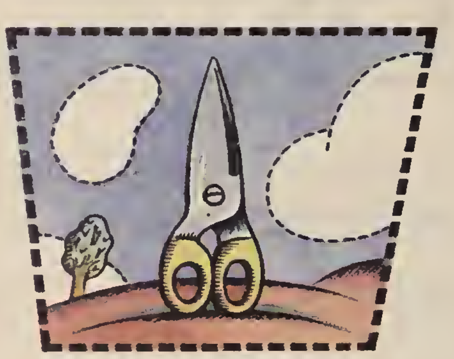


Summaries from leading scientific and management journals

Harvard Business Review

May-June 1990

"Rattling Sabre — New Ways to Compete on Information"
By Max Hopper

■ A pioneer in using information systems to create a competitive edge, Max Hopper of American Airlines says the days of systems such as Sabre are passing. Companies will not find it easy to lock in customers with systems. Furthermore, the systems are increasingly costly to develop and easy to copy.

As a result, firms with strategic systems are opening them up to rivals. Competition will mandate strategic alliances and savvy use of services and information available from outside suppliers.

Today, American Airlines can make more money selling its Sabre software for pricing airline seats than it can by keeping the technology to itself. It will differentiate itself in how its analysts use the information the system generates.

In the future, firms will pay less attention to critical applications and more to building platforms that support new structures and ways of making decisions. AMR Corp., an American Airlines subsidiary, is doing just that with its Interaact system, which converges data processing, office automation, personal computing and networking to help every AMR staff member do his job better, smarter and more creatively.

MIT Sloan School of Management

Working Paper 1989

"Information Technology Platforms for the 1990s"
By Stuart Madnick

■ The 1990s demand a flexible system architecture that can adapt to organizational changes and alternating forces of centralization and decentralization.

The logically separate components of such an architecture are as follows:

- **External interface.** Provides the entry point to the system. In the case of banking systems, for example, the external entity may be a payment network, communications network, customer terminal or professional workstation.
- **Message control.** Coordinates the passage of messages between processing components. This involves routing, translation, sequencing and monitoring.
- **Data control.** Coordinates access, format and passage of data between application processing functions and shared data resources.
- **Shared data resources.** Responsible for holding data for one or more applications. Shared data resources performs two functions: information management and storage management.
- **Application processing.** The external interface, message control, data control and shared data resources surround the applications processing components — transaction processing, information processing and administrative support.

Companies can fashion various configurations — from a mainframe approach to a distributed one — using these components. A mainframe setting places all logical components on a single physical computer. The machine uses explicit intracomputer communications to communicate among the components.

In a distributed approach, each component is a separate computer. Local-area networks and other communications facilities connect the components.

Anderson Graduate School of Management (UCLA)

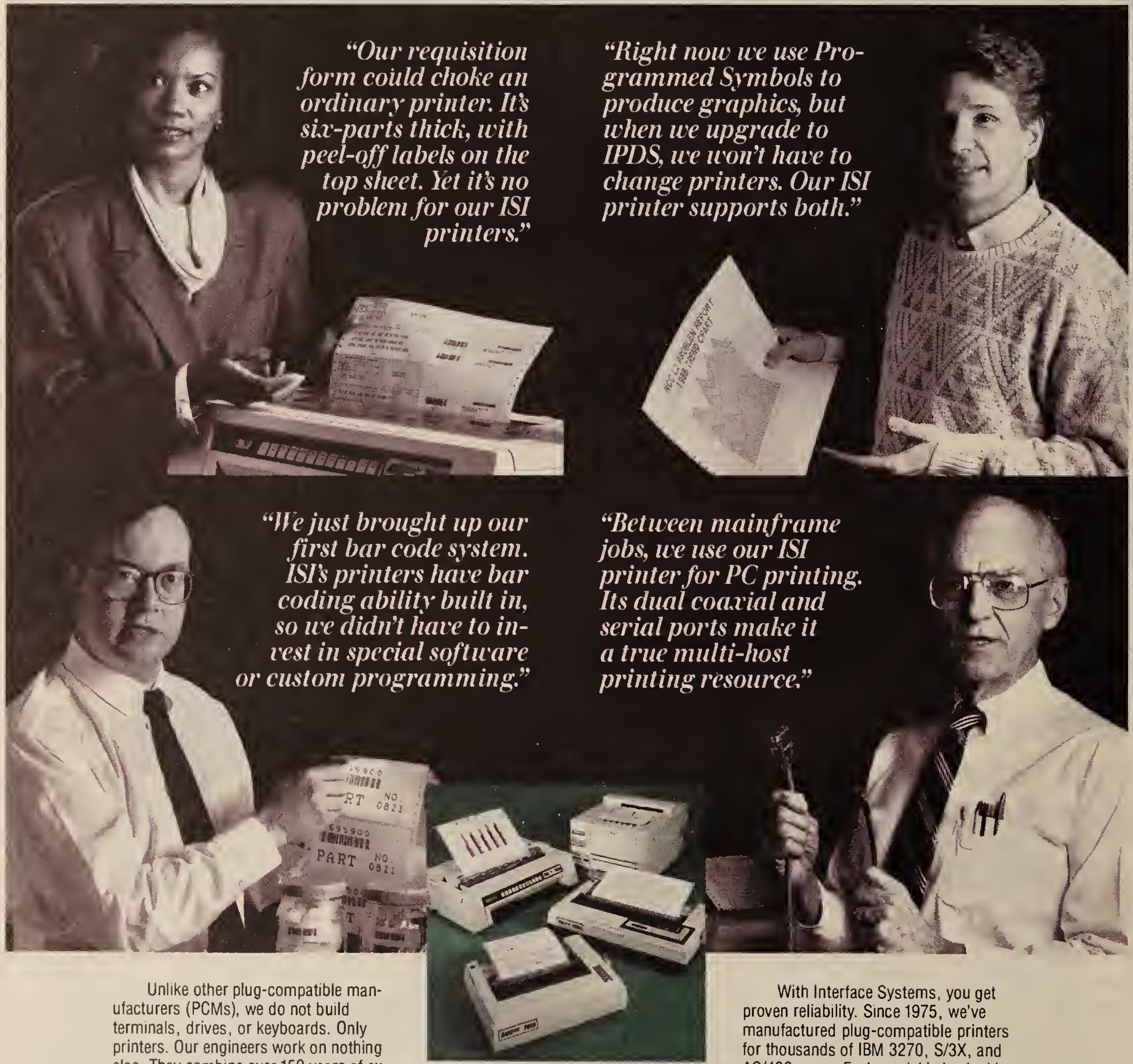
Working Paper No. 4-89

"Electronic Mail as the Medium of Managerial Choice"
By M. Lynne Markus

■ There are differing perceptions surrounding electronic mail and the extent to which it can be used within an organization. Until now, studies on managers' communications behavior and media choices have suggested that managers will not use E-mail very extensively and that when they do, they will use it in ways that resemble their own use of written reports and memos.

This study, however, found new patterns of media use not anticipated in previous studies. "Multimedia telephone calls" is one new pattern in which managers simultaneously read E-mail messages and discuss them on the phone. This pattern combines the advantages of writing with those of a brief phone call.

Another pattern is the "mosaic message." By using the "forward" instead of the "reply" command, managers compose composite messages that record the entire history of issues, including differing opinions and interpretations. This pattern clarifies the current meaning and documents it for future reference.



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Management society scheduled to install recently elected officers

BY ALAN J. RYAN
CW STAFF

CHICAGO — Laurance Burden, a senior vice-president at S.C. Johnson Wax and the firm's chief information officer, will be at the helm of the Society for Information Management (SIM) when its new board of officers is installed next month.

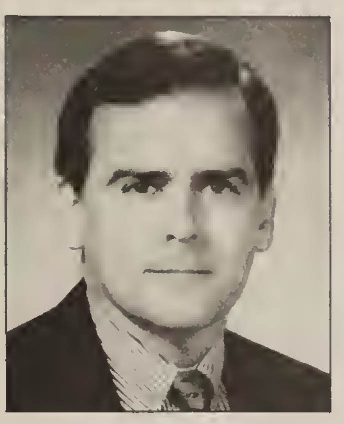
Johnson Wax's Laurance Burden

Burden, who has been with Johnson Wax since 1988, has worldwide responsibility for the company's information services and technology. He is a member of The Research Board and a board member of the Center for Information Systems Research (CISR) at MIT's Sloan School of Management.

In addition to assuming the role of president of SIM, Burden will continue to serve on the society's finance, meetings, strategic planning and executive committees.

John W. Owens, vice-president and CIO at Sara Lee Hosiery in Winston-Salem, N.C., will become SIM's president-elect. He is a member of the board of sponsors of CISR and a member of the Information Systems Steering Committee of the Grocery Manufacturers of America.

Owens has been a SIM board member since 1988 and serves both as chairman of the Institutional Member Advisory Committee and a member of the Annual Report and Partners in Leadership Award Selection committees.


Sara Lee's John Owens

Three new officer positions were created at SIM to emphasize areas of importance to the society. Filling the posts are Madeline Weiss, vice-president of communications; James A. Senn, vice-president of international affairs; and Ross Ahntholz, vice-president of programs and products.

Weiss is president of Weiss Associates, Inc. in Bethesda, Md., and serves as an adjunct professor at American University in Washington, D.C. Senn is director at Intec, the Information Technology Management Center in the College of Business Administration at Georgia State University in Atlanta. Ahntholz is corporate director of MIS and telecommunications at Olin Corp. and director of information services at Olin's chemicals group, both in Stamford, Conn.

Also named to a top post was Patricia M. Wallington, vice-president and CIO at Xerox Corp.'s U.S. Marketing Group in Rochester, N.Y. She will be SIM's vice-president of finance.

At-large SIM directors will be: Allan B. Deering, vice-president of management information services at Pepsico's corporate IS function in Purchase, N.Y.; Warren Harkness, director of information services at Bose Corp. in Framingham, Mass.; James R. Kinney, vice-president and CIO at Carlson Companies, Inc.; Joseph W. Rogers, vice-president of information services at Coca-Cola USA in Atlanta; and Robert M. Rubin, vice-president of information services at Atochem North America in Philadelphia.

MANAGEMENT BRIEFS

Award nominations sought

Entries are being accepted for the third annual Developing the Human Side of Technology Award. The award honors an information systems professional who, during the past year, was creative and effective in promoting a better understanding between IS and the business side of the organization.

Entries are due by July 31, and the award will be presented on Aug. 23 during **Ouellette & Associates Consulting, Inc.**'s Summer Workshops for the Information Processing Professional to be held in Nashua, N.H.

The 1989 winner was Mary K. Crozier, a trainer at General Mills, Inc. The award is open to professionals working in all aspects of IS, from both large and small IS organizations.

For more information, call Ouellette & Associates at (603) 623-7373.

Nominations are being accepted through Aug. 15 for the Fourth Awards for Achievement in Managing Information Technology.

The awards, sponsored by **American Management Systems, Inc.** and the Graduate School of Industrial Administration at Carnegie Mellon University, are presented to executives and professionals from the nation's leading organizations who have made outstanding contributions to their organizations through the effective use of computer and communications technology. Nominations are made by the chief executive officer and other top executives at the organizations.

Finalists will be selected after several screening periods. The awards will be conferred in May 1991 in New York.

Award criteria are based on the degree to which the nominated executive had a significant impact on the organization by enhancing management decision-making capabilities and planning, providing competitive advantage, delivering major efficiencies, improving management controls, reducing risks or improving service to clients, managers or other professionals with important relationships to the organizations.

For more information, contact Jan Dodson, American Management Systems, Inc. in Arlington, Va., at (703) 841-5830.

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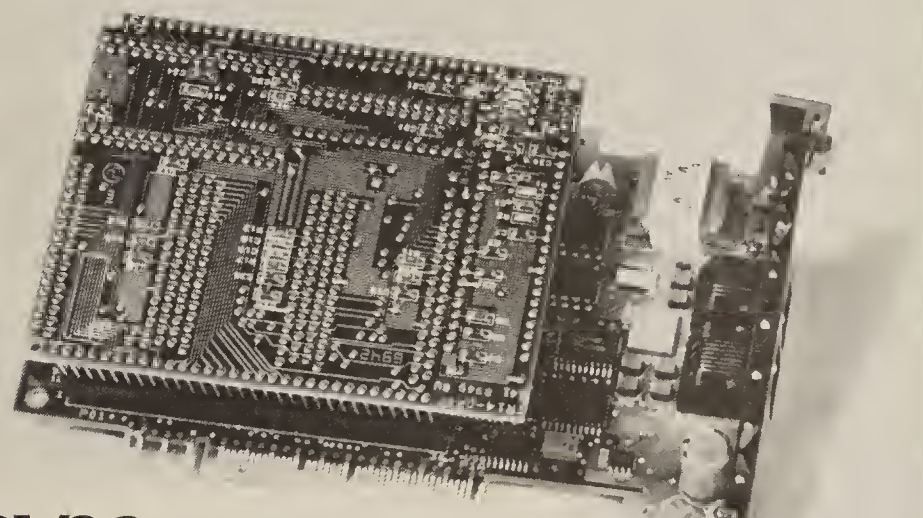

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Midway

CONTINUED FROM PAGE 63

> "WE ARE a young company. We don't have a plethora of old equipment with entrenched supporters."
>
> ROBERT KOHLSTEDT
> MIDWAY AIRLINES

In 1985, when new ownership brought in new management, Tate again petitioned for a separate IS department. At that time, Midway was reaching a critical stage.

"From an operational standpoint, we had 30 planes and were still growing," he says. "Below 30 planes we could get away [without automation], but when we went over that bright line of 30, we started to have problems."

"Squawks" were becoming harder to track manually, and computer services leased from Eastern Airlines, Control Data Corp. and others were only getting more expensive.

Midway management consented to a strategic review of IS functions. Tate says the review "concentrated on tasks with an operational necessity or a very quick payback."

The aforementioned flight planning was one of several functions that met both criteria and won over Chairman David Hinson in getting Midway to join the IS world. "To his credit, he did see the light," Tate says. In 1986, Tate was appointed vice-president of IS, and he hired Kohlstedt.

"We began a very ambitious and very costly plan," Kohlstedt says. Midway allocated $4 million over three years for automation of functions that met the necessity and payback criteria. The base hardware was an IBM 4381 mainframe. At many levels of the company, however, support for the effort was still given grudgingly.

"I spent a lot of time cajoling and petitioning because there was a fear and a reluctance to put a lot of money into something the chairman of the board was uncertain about," Tate says.

But the proof was in the payback. Midway has recouped about $3.75 million of the initial $4 million investment, Kohlstedt says, and from unlikely corners.

Outsourced payroll processing, for example, had cost Midway $240,000 per year for a service that offered limited data access for even common human resources duties. Kohlstedt estimates that Midway spent $200,000 in the first year to run payroll in-house, including the costs of terminals and payroll software.

Midway's Tate *helped to build the airline's IS group from ground zero*

Not long after that, Midway's new IS department developed a new emergency-turn application to aid a plane if an engine failed during takeoff.

Better yet

The Federal Aviation Administration requires all airlines to have contingency plans for such an event, but the in-house application went a step further by showing Midway pilots how they could safely bank and return to tiny Midway Airport while carrying a greater load than indicated by the service bureau application they had relied on previously.

This meant Midway's planes could legally carry more paying passengers. Tate estimates that the new program paid for its own development in the first week.

In developing such programs, Kohlstedt says he found he had one advantage none of his major competitors enjoyed. "We are a young company," he says. "We don't have a plethora of old equipment with entrenched supporters. We don't have that anchor."

Once the overall prejudice against computers was overcome, Kohlstedt says, there was little friction about which vendor or platform to use.

Kohlstedt and Tate have won the battle to computerize, but Midway remains an underdog as it seeks to grow from a successful regional carrier to a national player slugging it out with the likes of American Airlines, United Airlines and USAir. With Midway's recent acquisition of a second hub in Philadelphia, analysts predict it will be a $1 billion airline by 1992.

The next IS challenge? Midway is working on drastically automating the process of purchasing airline tickets and checking in at airports.

It is safe to say that Kohlstedt and Tate will again be fighting for high-tech ground — but this time with Midway's customers.

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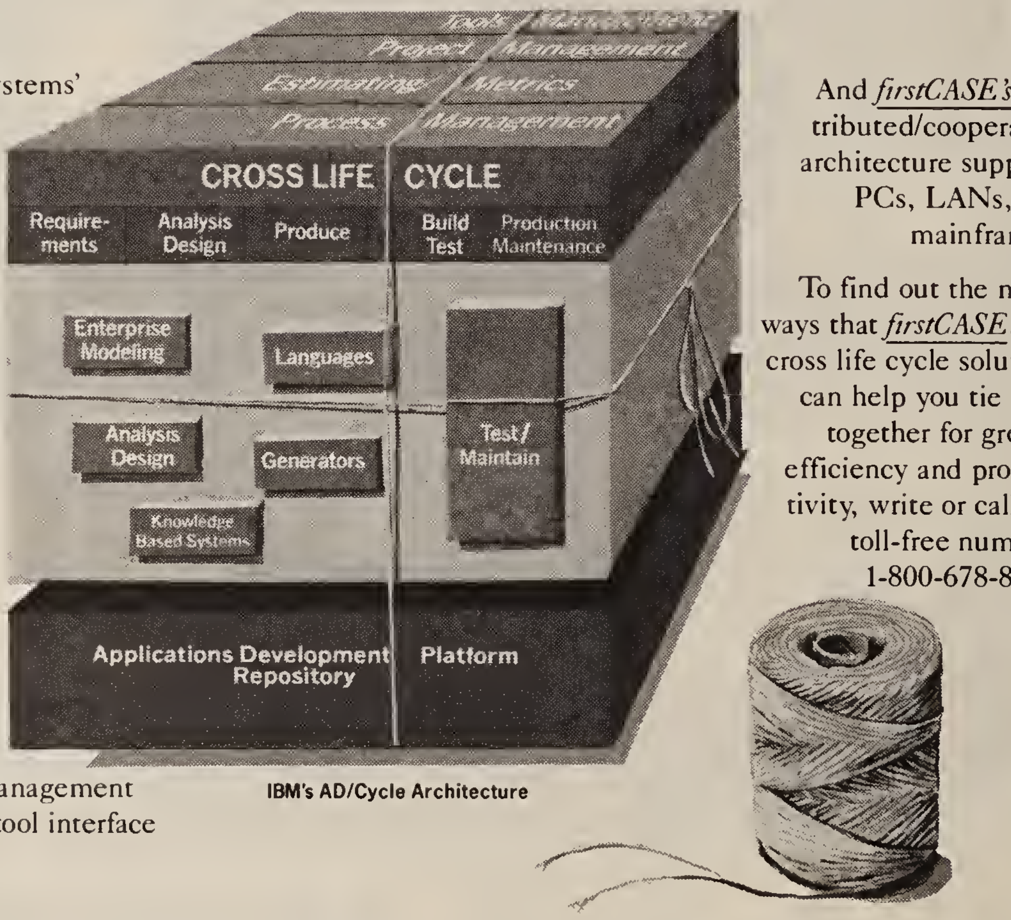

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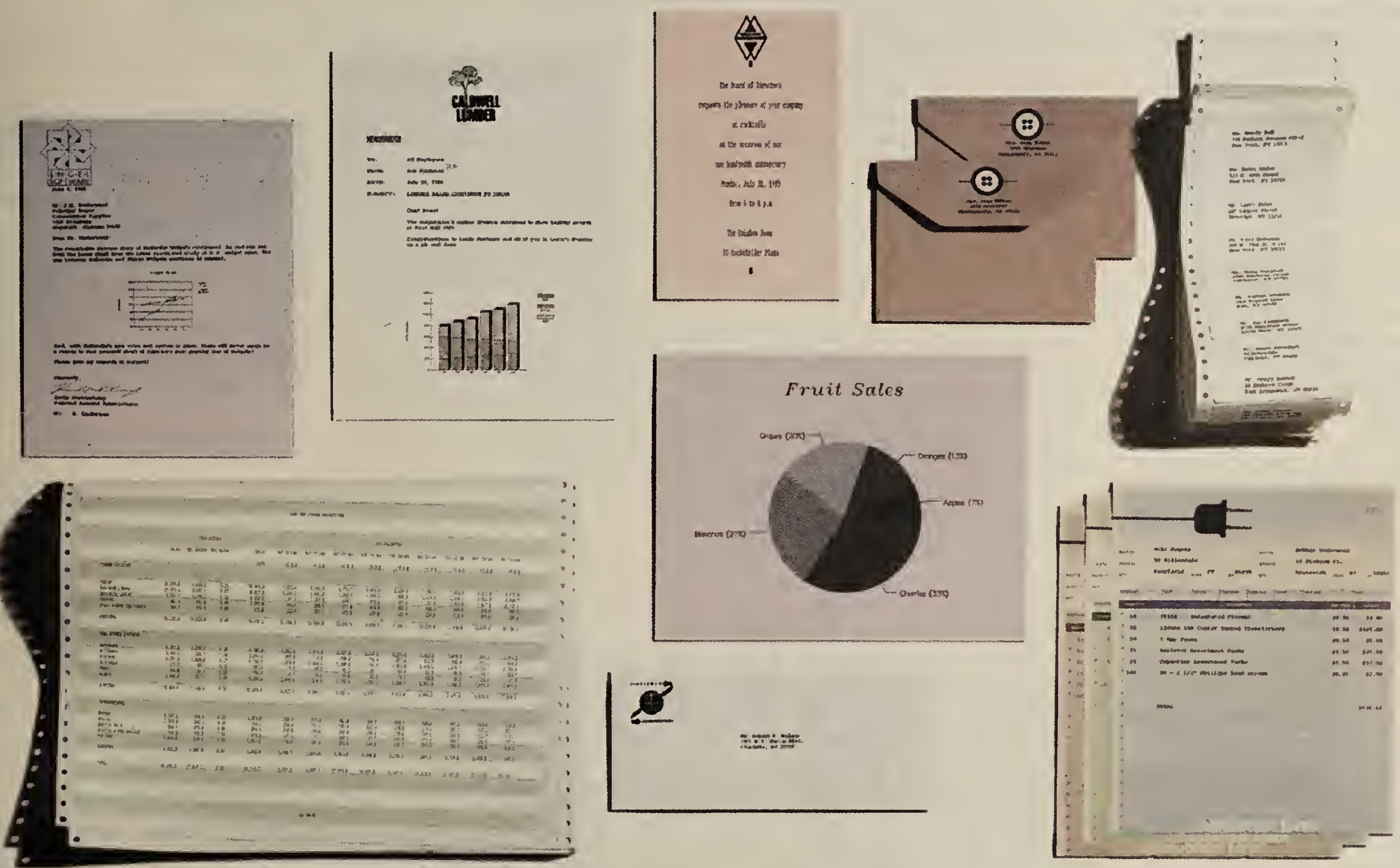

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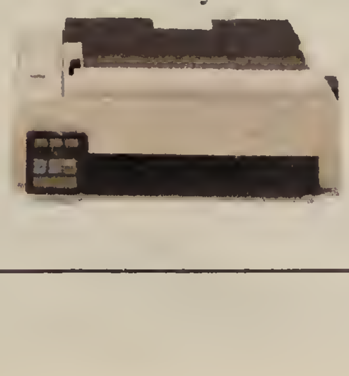

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TAKING CHARGE

Mary E. Scott

Time to rethink campus hiring

True or false: There are fewer college students today who have chosen to study information systems than there were five years ago.

Are you, like most IS professionals, surprised to hear that the correct answer is false? According to data published in a recent *Fortune* article, the number of college degrees conferred in IS-related studies has actually increased 28.1% since 1984. Why, then, do so many companies experience difficulty in staffing entry-level IS positions?

In the past, students who chose to study IS in college did so by electing a major in computer science, which was typically part of a "hard science" department such as math or engineering. For companies seeking to fill entry-level positions, recruiting was a straightforward proposition. IS managers listed the specific hardware experience and software knowledge needed for their jobs, and computer science majors possessing those skills applied and were hired.

In recent years, the number of students earning undergraduate degrees in computer science has indeed declined. But that's because most universities now offer IS degree programs in addition to the traditional computer science major. They try to attract students who want to blend their interest in technology with a broader discipline, such as business or even liberal arts.

Although such expanded options should meet the staffing needs of companies seeking employees who can build technology/business partnerships, the fact is that many company recruiters are still limiting their talent search to traditional campus sources.

In my consulting work with clients trying to improve the effectiveness of their college recruiting, I am often asked what specific action to take in order to get better results on campus. The following are three steps that will enhance a company's ability to develop a pool of qualified entry-level IS talent:

- **Take a hard look at selection criteria.** In most cases, I find that recruiters rely on outdated, generic requirements for "computer science majors with a 3.0 grade point average" followed by a laundry list of required technical skills.

An approach that will yield far better results from both a selection and retention standpoint involves a critical re-evaluation of the skills — both technical and nontechnical — that are absolutely necessary at the point of hire. Then determine which additional skills are desirable. Consider whether any or all of these skills can be developed through training once a candidate's aptitude for learning new technical skills has been determined.

- **Review the effectiveness of the colleges at which your company recruits.** Also, research the hiring and retention rates of the specific degree programs on each campus.

Focus on those universities that have provided your firm with the best matches for your specific positions, rather than flocking to those schools that appear on the myriad annual "Best MIS Schools" lists — unless, of course, those schools have truly proven to be your best sources.

Cultivating sustained interest at a core group of schools that best match your company's staffing needs will undoubtedly yield a cost-saving dividend. You'll find that you get better results while recruiting at fewer colleges.

- **Invest in interviewer training for everyone involved in the hiring process.** *Personnel Journal* recently reported that, as identified by students, the "most important factor in shaping an employer's image . . . [is] contact with company personnel."

Focus group research I conduct with recent graduates consistently supports this statement. It is critical that recruiters and hiring managers understand how to screen candidates and interview students in today's environment. Knowing how to evaluate unfamiliar skills while also leaving a favorable impression of your firm is becoming increasingly important as competition for students intensifies.

There are certainly those who will continue to lament the well-documented decline in the availability of traditional computer science majors and who predict dire shortages of applicants for critical positions during the next decade. One corporate recruiter recently explained to me the reason his company fell short of hiring entry-level IS staff was that "they're just not out there anymore."

Not so. The companies that recognize the shifts that have occurred in IS education and restructure their college recruitment strategies to take advantage of those changes find will that there is indeed a qualified — and growing — pool of talent on campuses. You just have to know where to look.

Scott, former director of staffing at Aetna Life & Casualty, is president of M.E. Scott & Co., a West Hartford, Conn.-based college recruitment consulting and training firm.

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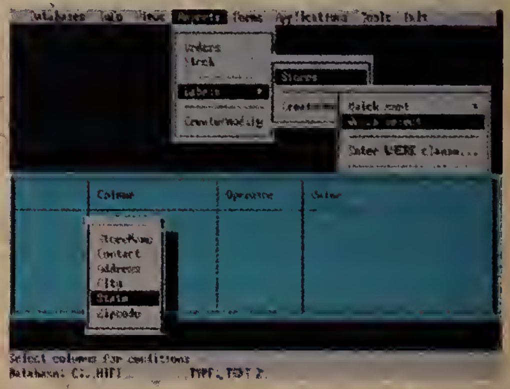

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CALENDAR

Bill Gates, chairman and co-founder of Microsoft Corp., will present the July 23 keynote address at Guide 77, the convention of the midsize and large-scale IBM systems users group. The conference will be held July 22-27 in Chicago. It offers more than 1,200 educational sessions for attendees.

For more information, contact Guide International Corp., Chicago, Ill., (312) 644-6610.

JUNE 24-30

Productivity and Profitability — Alliances and Partnerships of Information Services with Intro- and Inter-Organizational Enterprises. Dallas, June 24-28 — Contact: Chantico Publishing, Carrollton, Texas (214) 250-3644.

Execucom's IFPS Users' Association Annual Meeting. Pittsburgh, June 24-28 — Contact: Execucom, Austin, Texas (800) 531-5038.

Information Systems Leadership in the 1990s. Washington, D.C., June 26-27 — Contact: Ouellette & Associates, Bedford, N.H. (603) 623-7373.

Dexpo East (DEC Computing & Connectivity Exposition and Conference). Boston, June 26-28 — Contact: Expoconsul International, Princeton, N.J. (609) 987-9400.

Executive Workshop on Responsible Computing. Toronto, June 28 — Contact: Info-Quest, Toronto, Ontario (416) 365-1093.

Outsourcing Strategies for the '90s. St. Louis, June 28 — Contact: Donna Skaggs, Washington University Center for the Study of Data Processing, St. Louis, Mo. (314) 889-5380.

JULY 8-14

Information Center Conference and Exposition. San Francisco, July 8-12 — Contact: Weingarten Publications, Boston, Mass. (617) 542-0146.

American Production and Inventory Control Society Seminar and Exhibition. San Francisco, July 9-11 — Contact: APICS, Falls Church, Va. (710) 237-8344.

Software Engineering Strategies Conference. Vancouver, British Columbia, July 9-11 — Contact: Ashley Pearce, Gartner Group, Stamford, Conn. (203) 967-6757.

Navy Micro '90 Conference. San Diego, July 9-12 — Contact: Nardac, San Diego, Calif. (619) 545-8645.

Consulting Skills for the Information Processing Professional. Los Angeles, July 10-11 — Contact: Ouellette & Associates, Bedford, N.H. (603) 623-7373.

Information Networking: Technologies & Applications. Washington, D.C., July 10-12 — Contact: Ms. Schoen, Bell Atlantic Educational Services, Princeton, N.J. (800) 327-8412.

Data Modeling and CASE. Boston, July 11-13 — Contact: Digital Consulting, Andover, Mass. (508) 470-3880.

Service and Quality: Transforming the Vision into Reality. St. Louis, July 11-13 — Contact: Donna Skaggs, Washington University, St. Louis, Mo. (314) 889-4556.

National Office Machine Dealers Association Meeting. Las Vegas, July 11-14 — Contact: Kathy Dunn, NOMDA, Kansas City, Mo. (816) 941-3100.

JULY 15-21

Association of College and University Telecommunications Administrators Annual Conference and Exhibit. Orlando, Fla., July 15-19 — Contact: Lisa McLemore, ACUTA, Lexington, Ky. (606) 252-2882.

Managing Quality Function Deployment. Dallas, July 16-17 — Contact: Technology Training, Torrance, Calif. (213) 534-3922.

EDI in the International Marketplace. San Francisco, July 16-18 — Contact: International Congress Registrar, Alexandria, Va. (703) 838-8042.

Engineering Workstations Conference. Boston, July 16-18 — Contact: EWC, Santa Monica, Calif. (213) 450-0500.

Industrial and Engineering Applications of Artificial Intelligence and Expert Systems. Charleston, S.C., July 16-19 — Contact: Dr. Moonis Ali, University of Tennessee Space Institute, Tullahoma, Tenn. (615) 455-0631.

Telephone Network Overview. Cincinnati, July 17-18 — Contact: CBIS Network Technologies, Cincinnati, Ohio (800) 543-4477.

Database World Conference & Exposition. Santa Clara, Calif., July 17-19 — Contact: Digital Consulting, Andover, Mass. (508) 470-3870.

Macintosh/New York Conference & Exposition. New York, July 17-19 — Contact: Exposition Management, Waltham, Mass. (617) 290-0400.

Developing Procedures, Policies and Documentation. Houston, July 17-20 — Contact: Information Mapping, Seminar Division, Waltham, Mass. (617) 890-7003.

Multivendor Networking: Linking PCs, Minis and Mainframes over Local- and Wide-Area Networks. San Francisco, July 17-20 — Contact: Learning Tree International, Los Angeles, Calif. (800) 421-8166.

SNA Gateways: An In-Depth Examination. Santa Clara, Calif., July 18-20 — Contact: J2 Software Labs, Santa Cruz, Calif. (408) 292-6300.

JULY 22-28

North American Conference of International Business Schools Computer Users Group Meeting. Omaha, July 22-25 — Contact: Sufi Nazem, College of Business Administration, University of Nebraska, Omaha, Neb. (402) 554-2816.

The CAMMP Show for Computer-Aided Graphics, Multimedia and Presentations. Chicago, July 23-27 — Contact: Knowledge Industry Publications, White Plains, N.Y. (914) 328-9157.

Multi-Net Expo '90. Houston, July 25-26 — Contact: Ann Garner, Multi-Net Expo, Houston, Texas (713) 827-8030.

Utah State University IT Institute. Logan, Utah, July 25-28 — Contact: Monique Squire, Logan, Utah (801) 750-1690.

JULY 29-AUGUST 4

AI-1990 Conference. Boston, July 29-Aug. 3 — Contact: American Association for Artificial Intelligence, Menlo Park, Calif. (415) 328-3123.

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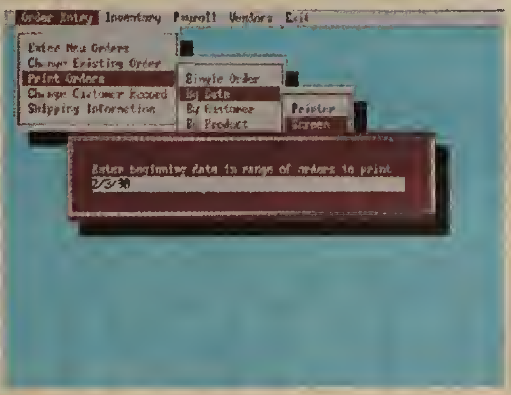

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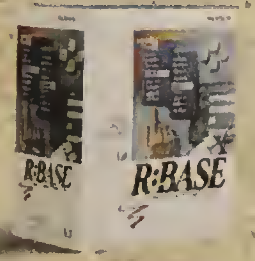

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PRODUCT SPOTLIGHT

SECURITY

Biometrics creep into business

BY JON WILLIAM TOIGO

If a data center employee gets locked out at Connecticut Bank & Trust, it won't be because he forgot his key. Two years ago, the bank installed a security system that works with something impossible to drop or leave behind — fingerprints.

At one time, the bank controlled access to its data center in East Hartford, Conn., with magnetic-stripe cards and card readers, but there was a problem with this method: "You can drop your card in the hallway, and whoever finds it has access," says Bill Wentworth, an officer at the bank. "Plus, there are control issues — you have to depend on exiting employees to turn in their cards."

By replacing the magnetic-stripe card readers with biometric fingerprint scanners, the bank identifies 340 employees and senior managers with something that is unalterable, cannot be stolen or imitated and is unique to each employee at the bank.

In addition to expressing a natural curiosity about this seemingly futuristic technology, many in the security field believe there's no more foolproof way to identify individuals than through their biological characteristics — such as retinal blood vessel patterns, hand geometry and fingerprints — and their behavioral idiosyncrasies, such as keystroke dynamics, handwritten signature and vocal intonation.

"Biometrics offers something other systems don't," says Alan Zimmerman, an associate at Booz, Allen & Hamilton, Inc., which recently completed independent tests on fingerprint and retinal scanners for the Pentagon. "Keys can be duplicated; biometrics can't." Because they can keep records of identities and access times, Zimmerman says, these devices can "prove irrefutably that John Doe was the one who came through this door at 11 last night."

In addition, the system can be adjusted to allow or deny access at any given time of day. "When someone leaves or changes positions," Wentworth says, "we can restrict door access by changing the person's record on the IBM Model 30 PS/2 that controls all of the biometrics."

Although biometric access control devices have existed for 20 years, high cost and questionable reliability have kept them out of commercial installations. Recent successes in government environments, specialized applications such as driver's license programs and organizations that need to strictly control physical access, are starting to draw attention, however. At the same time, prices are plummeting, and independent test results are starting to show improved reliability.

At $2,020, the average unit price for a biometric system has dropped almost $9,000 since 1985, says Ben Miller, editor of the *1990 Biometric Industry Directory* as well as "Personal Identification News," an industry newsletter in Bethesda, Md.

Jamie Hogan

Unit sales for all types of biometric systems increased 167% last year. But, Zimmerman says, that increase is attributable to large projects being undertaken by state and federal governments. Nevertheless, because of these projects, "the cost of the systems is going down, and acceptance has grown," he says.

Of the biometric methods based on biological characteristics, fingerprint identification is the most popular, accounting for 36% of the value of all biometric units shipped in 1989, according to "Personal Identification News" (see chart page 76). The three primary U.S. vendors are Identix, Inc., Fingermatrix, Inc. and Digital Biometrics, Inc., with Identix leading the pack in sales. Individual units cost about $3,500.

Although law enforcement applications dominate these sales, banks are also early adopters. At the law offices of Bank of Boston, 80 employees type in their personal identification numbers and scan their forefinger before entering the computer room.

The device's reliability is "very satisfactory," says Dolores Tilton, who manages the law offices. "I'd put our success at about 90% to 95%."

These systems are not without glitches, however. When users' hands are cold, they sometimes get rejected. While the manufacturer recommends applying hand creme or warming hands in water, Tilton says, she periodically has to resort to reenrolling people.

Fingerprint readers encounter another obstacle as well. Employees may object to the idea of having their fingerprints taken because of its association with criminal bookings.

Retinal scanners suffer less from the criminal stigma but encounter another obstacle: fear. Many people don't like the idea of exposing their eyes to the infrared light these devices direct through the pupil to the back of the eye to read retinal patterns.

Despite their proven low failure rates and small memory requirements, these devices are not universally well received.

At Honeywell, Inc. in St.

INSIDE

Pattern Scanners
Intrusion detection software is coming out of the labs. Page 79.

Product Guide
A comprehensive listing of network encryption devices. Page 85.

Extra Padding
Tokens can add bulk to your password system. Page 88.

Toigo is a free-lance writer in Clearwater, Fla., who specializes in business computing topics.

Biometrics

CONTINUED FROM PAGE 75

Louis Park, Minn., however, employees willingly use their eyes to get behind secured doors at the high-security building. This producer of military classified products replaced cipher locks on its doors with retinal scanners from Eyedentify, Inc., which is the only developer of such systems. Devices are priced from $4,995 to $6,995.

"We were having to change the lock every time someone changed jobs or there was a plant layoff," says Mike Jones, production manager at Honeywell. "With the eye scanners, we just delete the employee's scan data when he leaves."

Jones says he's had no trouble with user acceptance. As for failure rates, "we almost never get false readings," he says. "When we first enroll a person, we take at least five scans. At least five scans have to match within 90% before we'll log a person into the system."

The state of California is also considering adding retinal scanners to its driver's license application procedure to foil people who apply for a driver's license in more than one state.

While there are four producers of hand geometry units, only one — Recognition Systems, Inc. — has a commercially available product. The $4,995 device stores a top- and side-view photograph of a person's hand on a template and then guides the user to place his hand on a pad to verify identity.

The University of Georgia is testing the use of a hand geometry device, according to Recognition Systems. The system, which is being spearheaded by Electronic Access Systems, a systems integrator, will require students to validate their identities via hand geometry before they are served at the campus cafeteria.

Firms that believe it would be insulting for users to submit to such a test of their identity might opt for a device based on behavior, such as signature verification, voice recognition and keystroke dynamics. "Physiological devices such as fingerprint, retinal scan and hand geometry can be perceived as intrusive to the individual," Miller says. The behavioral devices, however, are based on activities a person probably does every day — sign his name, speak in normal tones and use a keyboard — and thus are more acceptable.

"With the professional clientele we deal with, we just weren't comfortable with a fingerprint reader," says Gerald Lloyd, executive vice-president at Innovative Interfaces, Inc., which sells film and video supplies to dealers. Instead, the firm chose Sign-On, a $495 signature verification product from Autosig, Inc.

As the user signs his name with a special pen on a digitizing tablet, Sign-On — currently the top seller of signature verification devices — measures various elements of the signature, such as stroke length and how fast each stroke is completed. It also accounts for variations in signatures over time. Other vendors are Rolls-Royce Business Ventures Ltd. and Cheque Alert, Inc. Rolls-Royce's product — due out this year — verifies signatures based on the sounds made as the user signs his name. Cheque Alert's Digiscan System compares static signatures.

While these devices account for only 5% of total biometric sales, their appeal to banks, especially to avoid fraud, may boost that number. In addition, IBM recently introduced a system, lending credence to the market.

One inherent problem with signature verification devices is that after a prolonged period of time of not using them, users might get rejected because their signatures might have changed.

Taking aim

Accuracy on all biometric systems is measured as Type 1 errors (rejecting an authorized individual) and Type 2 errors — (accepting an unauthorized user). Type 2 are usually seen as the more serious.

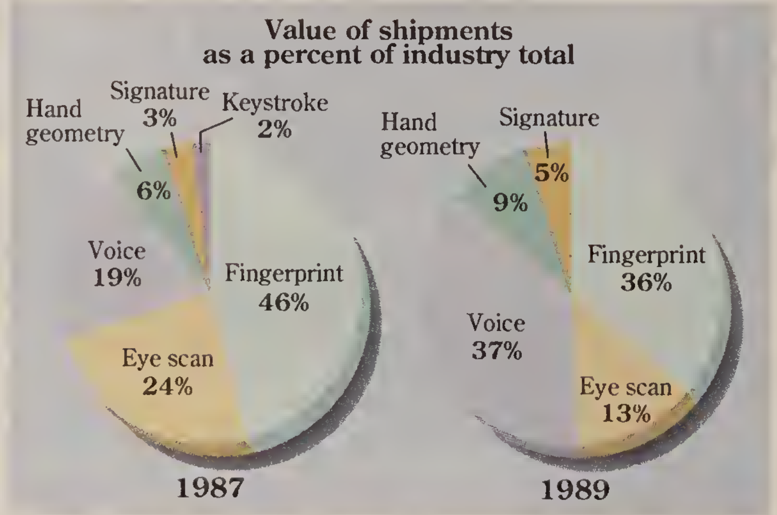
The Pentagon and another government client were concerned enough about reliability that they commissioned Booz Allen to run tests of two biometric products — the Identix fingerprint reader and Eyedentify's retinal scanner.

The fingerprint reader was used by the Pentagon seven days per week for more than a year, and the retinal scanner was tested in the laboratory for about five months. There was never a system failure on either device, Zimmerman says, and although he would not comment on Type 2 errors, he says very few Type 1 errors occurred. In fact, he says, most systems available today have Type 1 errors "under very good control."

In a real user environment, Zimmerman warns, there are always going to be some number of Type 1 errors, due as

Voice vote

Although fingerprint scanners still claim the largest installed base of biometric devices, voice verification equipment orders have surged



Source: Personal Identification News

CW Chart: Paul Mock

Voices of experience

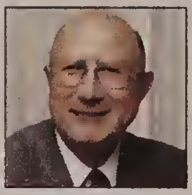
What security vulnerabilities are companies most likely to overlook?

Companies generally allow people too much access to files outside their functions. They think that allowing any number of users "read" instead of "edit" access to files is safe, but there might be files floating around that the organization isn't aware of, such as ones containing user passwords. "Least necessary privilege" is the best policy. — *Peter Goldis, independent security consultant, Cambridge, Mass.*

Most access control devices are designed around telephones and modems. People nail shut their front doors but don't pay attention to all the other ways intruders can get into their computer — through WANs and LANs. Dial-back modems have no effect at all in securing a WAN because there are so many different points of entry, like remote divisions and modems hooked directly to a person's desktop PC. People have got to protect each node on a network. — *Clifford Stoll, astronomer at the Harvard Smithsonian Center for Astrophysics in Cambridge, Mass., and author of The Cuckoo's Egg.*

Most often, it's basic things that get overlooked — for instance, using passwords as an access protocol. They are just so phenomenally simple to break. Anyone who has an autodialer with very simplistic application software can run through a series of the more standard access-code protocol combinations.

Information printed at the top of many printouts gives out a lot of clues, as well, including file names and either the user's password or some sort of identifier. All of these bits and pieces can be put together, bringing you that much closer to a complete password. A lot of people just toss these documents into the trash to be read by anyone. — *Lindsay L. Baird Jr., private computer crime investigator, Info-Systems Safeguard, Inc., Morristown, N.J.*



Internal access control is often overlooked. We've started looking at clients' system accounting records and are finding computer usage that is not paid for or accounted for by a specific group of users. This represents a fundamental vulnerability. If you can't account for 100% of your computer use, then for security purposes, none of it is accounted for. What you have got to do is beef up the system accounting staff to track down discrepancies and be able to reconcile all usage records to valid sources. — *Donn Parker, senior management consultant, SRI International, Menlo Park, Calif.*

What type of access control product do you think organizations are going to start implementing?

Goldis — What I call "secondary authentication methods." Organizations are beginning to use two other ways of validation beyond traditional passwords: something the user *has*, like a smart card for an ATM, and something the user *is*, like a biometric identification. Because the "has" method is closer to being salable, it's growing faster than the "is" method.

Stoll — Intelligent routers, also called intelligent gateways. While a regular gateway lets everyone's packets through, an intelligent gateway has an access log of acceptable passwords and denies access to anyone not on the list.

Parker — Personal computer access control packages. For one thing, there are tens of millions of PCs out there. Secondly, there is a growing awareness of the vulnerabilities of and reliance on the functioning of a company's PCs.

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much to human error as to system error. For example, he says, some people have less distinct fingerprints than others.

The software can be adjusted to decrease Type 1 errors by turning down the sensitivity. This, of course, will make Type 2 errors rise.

User training is probably the best way to keep errors to a minimum, Zimmerman says. For instance, a user should be instructed how to hold his finger while being scanned. It should be positioned as flat as possible on the reader, as errors can occur when the finger is angled or when skin is particularly dry.

Zimmerman says that companies should expect a learning curve of about two to three weeks, depending on the number of people using the system.

Training has another positive side effect, Zimmerman says: enhanced enthusiasm. At the Pentagon, the more interested people were in the systems, the less frustrated they became with a false reject.

Others take an equally pragmatic approach by taking imprints of two different fingers in case one is rejected.

"When you sign on, you type your code, and the reader tells you which finger to enter," Bank of Boston's Tilton says. "If something goes wrong, it prompts you to use your alternate finger. It's pretty foolproof."

Sometimes, keeping false rejects to a minimum is key. At MCI Communications Corp., Bob Wilson is evaluating voice pattern technology in connection with the company's credit-card calling applications. "There can be big differences in the microphones that are used to enroll a person and those that the person uses when seeking authentication," says Wilson, advisory engineer for technical security at MCI. "If you enroll on Microphone X, you may not be able to pass an access check when you use Microphone Y."

Because he wouldn't want to subject a valid customer to a false reject, "we'd rather risk passing through a few free calls than reject a valid call," he says. Wilson says he plans to improve the technology so that, if it errs, it errs on the side of false accepts.

On the other hand, Wilson says he would not want to tolerate false accepts on the fingerprint readers MCI is testing in its executive wings of the building. "That technology is solid as a rock," he explains.

"Since we were attempting to control access, we were looking for something that would not permit false accepts. We figured we were paying our employees to be rejected a couple of times."

While most biometric devices in place today secure physical access to computer and other sensitive areas, many observers say they will increasingly be used to secure the computers themselves. One type of biometric access control that is particularly suited to this task is keyboard dynamics, of which two exist today.

Keyboard dynamics products measure such things as typing speed and how hard the user hits the keys. If they sense that speed or touch has changed, they automatically log the user off.

Like voice verification, these systems do not intrude to any great degree on how people normally work. In addition, since it works via an add-in card, there is no extra footprint.

WHILE MOST biometric devices in place today secure physical access to computer areas, many observers say they will increasingly be used to secure the computers themselves.

Because the first products of this type monitored users for an entire on-line session — during which time typing patterns would change naturally due to fatigue — they were plagued by a high rate of false rejects. The newer devices — from International Biometric Systems, Inc. and Schlage Electronics — capture fewer keystrokes, such as a user's name or log-on and password, which users tend to re-enter fairly consistently. The devices sell for roughly $500.

What will bring biometric systems to real fruition, experts say, is their eventual integration with other existing technologies. For one thing, says Randy Perry, a senior consultant at GSA International, a consulting firm in Cambridge, Mass., most biometric systems today are sold as stand-alone devices; organizations dedicate a PC to manage several biometric devices. Perry and others say the systems will eventually be integrated into larger platforms so that they run on a company's existing setup.

Smart cards will also be a vehicle for biometric popularity. With more personal information stored on the microprocessor-based cards, strict controls such as biometrics can ensure their confidentiality.

Miller adds that manufacturers of magnetic-stripe cards are interested in developing software interfaces between their cards and biometric devices.

Many believe that biometrics will gain more widespread adoption through this combining of technologies. However, Zimmerman says, biometrics answers a specific set of needs and problems, and only those who have a need to strictly control access and prove identity beyond a doubt will be able to cost-justify their expense. "Prices have come down and will continue to come down," he says, "but people that don't really need that kind of security won't want to pay." •

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Software as system sentry

KAREN FITZGERALD

To keep an eye on their property, some people use a watchdog. Expert-driven software that will do the same for a company's audit trail is now being designed, due for commercial shelves later this year.

Several research laboratories, such as SRI International, Los Alamos National Laboratory and the National Computer Security Center (NCSC), have been laboring for several years on various versions of "intrusion detection software." This software learns how employees typically behave on the system and sets off alarms when usage patterns deviate too far from the norm. It also sends up a flag when it detects breaches in a company's security policy.

Grance *uses Haystack to analzye audit trails at the Air Force*

Rather than catching intruders red-handed, these systems are intended to alert security officers to possible security threats. "These packages don't generate smoking guns," says Steven Smaha, founder of Haystack Laboratories in Austin, Texas, a consulting firm that worked with Los Alamos to develop software for the U.S. Air Force. "The trick is to provide the security officer with enough information about an anomaly to investigate further."

So far, funding for the software has emanated from government agencies, which are using the software to meet Department of Defense requirements. Now, however, these packages are being modified for commercial use.

Acceptance factors

The concern is how well these packages will be accepted in the business world and if they will be able to meet civilian needs.

"It's an interesting idea," says Robert Courtney, a computer security consultant in Port Ewen, N.Y., "but you've got to understand the business very well to detect anomalies on a computer system."

SRI is now developing versions of the Intrusion Detection Expert System (IDES) for the U.S. Navy and the Federal Bureau of Investigation. Vendors have expressed interest in modifying the IDES model — which is the prototype for all the other versions — for commercial use, says Fred Gilliam, one of the two main software engineers on the IDES project.

Los Alamos' version, Alap, has been tested by the Department of Energy on 20 to 30 mainframes since January, and the lab expects to introduce an improved version as a commercial product — to be called Wisdom & Sense — within a year.

NCSC developed its own version of the IDES model, called Midas, and is using it internally.

IDES, the original model for this type of software, uses two strategies to detect intruders: statistical profiles of user activity and expert system rules. The system collects data indicative of user habits during a typical CPU session. Such data may include log-on time and place, length of session and directories of files accessed.

The program then compares the data with a statistical profile of normal activity for each category of user and flags activity when it ranges outside a probability distribution.

To accommodate normal changes in users' work habits, the package periodically adjusts the user profile. However, a savvy user could take advantage of the system adjustment, changing his behavior slowly (for instance, logging off a little bit later each day) so as to create a perfect scenario for a break-in without getting flagged. This is where expert system rules come in.

These rules were designed to pinpoint suspicious behavior, independently of whether a user is deviating from behavior patterns. "Using a medical analogy, the statistical package checks to see if a user is behaving like a healthy person," Gilliam says. "The rule-based component tries to match the user to sick behavior."

The rules encode information concerning security policy breaches, system vulnerabilities and previous intrusions. For example, a rule might flag privileged-access users logging on via modem if it breaks policy, or it may note a case in which access was attempted with the same user log-on in two diverse locations within half an hour.

A commercial version of IDES would incorporate generalized rules that meet the needs of many different types of installations, as well as a customized set of rules for specific machines and operating systems.

One problem that might appear on these systems is cost. While no prices have been set, one sophisticated package being tested at a major corporation could cost from $150,000 to $200,000, the developer says. Also, critics are skeptical about the general-purpose versions meeting a company's specific needs. "I believe you can write programs for a particular environment that will work, but I don't think you can pick up that program and take it someplace else," Courtney says.

"One size fits all is not a successful intrusion detection tool," says Steven Eisen, supervisor of computer security for AT&T's research and development network.

However, the people who have used custom versions express satisfaction with the packages. "We've caught some unusual events that bear further scrutiny," says Capt. Tim Grance, a computer scientist at the Air Force's Cryptologic Support Center in San Antonio.

The Air Force downloads audit trail data to a Zenith 248 microcomputer for analysis by Haystack daily or whenever there is a concern about a security breach. It has reduced the daily audit trail from a seven-foot-high stack of paper to eight or nine sheets of analysis, Grance says. The Air Force's concern is not penetration by a dogged and highly skilled hacker. What it wants to prevent is tampering by its own staff.

While these systems are intended to monitor transgressions by insiders as well as outside intruders, some observers emphasize that no software is a match for human nature. "It takes more than software and data processing to outsmart crooks," Courtney says. ●

Trailblazers

Two commercial packages that borrow from the rudiments of the IDES approach are AT&T's Computerwatch and Clyde Digital's Audit.

Audit scans the audit trail generated by the Digital Equipment Corp. VAX/VMS operating system for 14 indications of possible security problems, such as sessions after business hours, sessions indicating browsing and dial-up sessions. It then assigns each user a score, which it derives by adding numbers weighted for each type of event, and creates a security summary report ranking each user in order of risk.

Two other reports give more detailed information on each security event. Users can modify which events they want the system to scan. The DEC Vaxstation version of Audit is priced at $1,282; the DEC VAX 9420 version is $15,536.

Computerwatch monitors the audit trail generated by the AT&T Unix System V MLS operating system. Using a set of 39 parameters, it generates a report similar to Audit's. Unlike Audit, Computerwatch allows the security manager to query the database containing audit trail data using either customized or standard queries.

In addition, users can run the database against an expert system program that watches for activities that are beyond the threshold for normal activity. For example, if the number of files accessed is high considering the number of users logged on, the expert system prints out a warning message in red (for activity above a threshold) or yellow (for activity below a threshold) and then explains why the activity was flagged.

Computerwatch is available for $2,000.

KAREN FITZGERALD

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Fitzgerald is an associate editor at *IEEE Spectrum*, a monthly magazine for members of the Institute of Electrical and Electronics Engineers.

BUYERS' SCORECARD

ACF2 locks up access control ratings

BY MICHAEL SULLIVAN-TRAINOR

What mainframe security product has been cast in nearly as many roles and stayed popular for as long as strongman Arnold Schwarzenegger?

The answer, according to *Computerworld's* Buyers' Scorecard survey of access control products for IBM mainframes and compatibles, is ACF2, now a product of Computer Associates International, Inc. The 12-year-old package has a varied past: Its developer, a company called SKK, was purchased by Uccel Corp., a company that, in turn, was bought by CA.

When responses from 240 information systems professionals currently using the products were tallied, ACF2 edged past IBM's RACF and another of CA's offerings, Top Secret, in user ratings of 16 criteria. Based on overall ratings, Systems Center, Inc.'s VM Secure scored a close fourth in a field that was made up of the four market leaders.

Total scores were based on a weighted combination of the numerical ratings of all criteria (see methodology next page).

ACF2 initially won much of its installed base by taking an opposite approach to security than that of IBM's RACF. RACF left everything unprotected upon installation and required security officers to specify which systems to protect. ACF2, on the other hand, automatically protected everything, and officers had to specify what not to protect. This method relieved security officers of the task of confronting users about whether their data should be protected.

"Initially, most of us went with ACF2 because it offered protection by default," says Don Lavin, manager of computer data security at Rohm and Haas Co. in Philadelphia. "ACF2 is doing everything we want. I wouldn't dream of converting it. We have 1,300 IDs that I'd have to change."

IBM has since added functions to RACF that allow users to implement protection by default. Primary differentiations between the products are diminishing, as reflected by the closeness of the survey results.

The ratings do indicate, however, that there are still some features that set the products apart. Users of ACF2 report that the product shines in the protection functions, such as transaction control.

RACF users rate it highest in the systems environment functions, such as integrating with the operating system.

Top Secret, which came out later than ACF2 and RACF, scores particularly well in ease-of-use areas.

VM Secure scores highest in ease-of-use categories, as well as the most important criterion to users — password management.

Sullivan-Trainor is a *Computerworld* senior editor, features.

A summary of what users say are the most and least effective aspects of each product

Product: **Mainframe Access Control**	Score	**Strengths** Top three ratings:	**Weaknesses** Bottom three ratings:
🟥 CA-ACF2	55	First-place finishes: 8	Last-place finishes: 1
		Audit trail functions Transaction control Documentation	Ease of installation Password management support Integrating with operating systems
🟩 CA-Top Secret	54	First-place finishes: 2	Last-place finishes: 5
		Ease of security monitoring & reporting Password management support Overall ease of use	Integrating with operating systems Quality of service & technical support Documentation
🟨 IBM's RACF	54	First-place finishes: 4	Last-place finishes: 7
		Integrating with operating systems Quality of service & technical support Interfaces with DBMS & applications	Password management support Transparency of control features Overall ease of use
🟪 System Center's VM Secure	53	First-place finishes: 4	Last-place finishes: 5
		Password management support Transparency of control features Overall ease of use	Interfaces with DBMS & applications Audit trail functions Transaction control

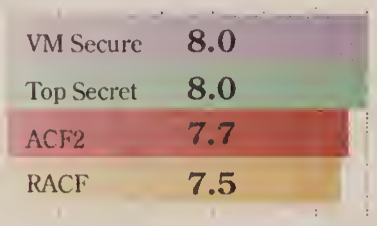
Key ratings

Despite its last-place finish in the overall score, VM Secure tops three of the eight categories of most importance to users. RACF also takes three key ratings.

Criteria presented in order of importance to all users (based on a scale of one to 10)

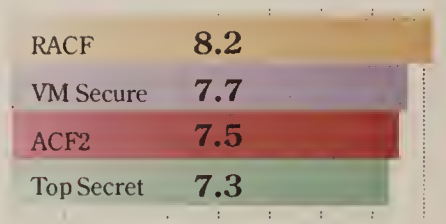
❶ Effectiveness of password management

Criteria importance rating: 8.4



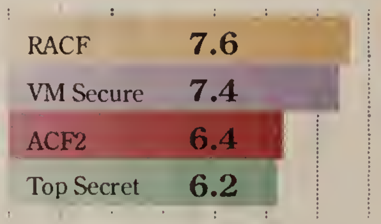
❷ Integrating with operating system and utility software

Criteria importance rating: 8.4



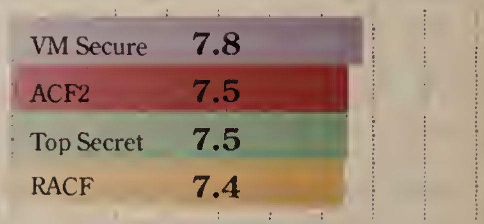
❸ Quality of service and technical support

Criteria importance rating: 8.3



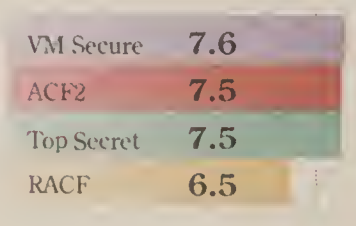
❹ Transparency of control features to users

Criteria importance rating: 8.3



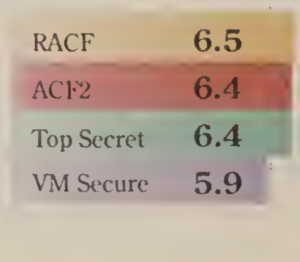
❺ Overall ease of use

Criteria importance rating: 8.2



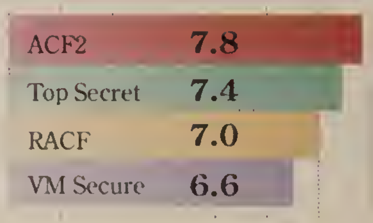
❻ Interfaces with DBMSs, applications & related tools

Criteria importance rating: 8.0



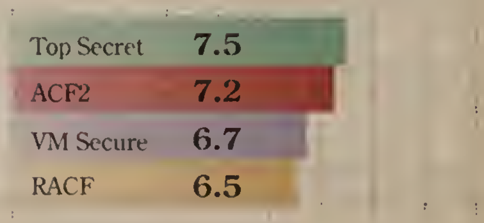
❼ Audit trail functions

Criteria importance rating: 7.9



❽ Ease of security monitoring & reporting

Criteria importance rating: 7.9



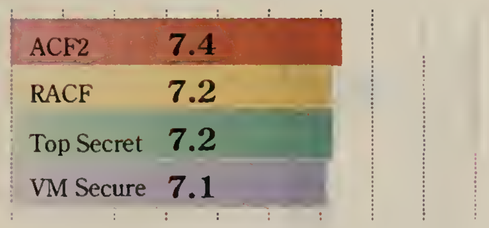
A closer look

ACF2 rates highest in seven of the eight remaining categories, including transaction control and documentation

Criteria presented in order of importance to all users (based on a scale of one to 10)

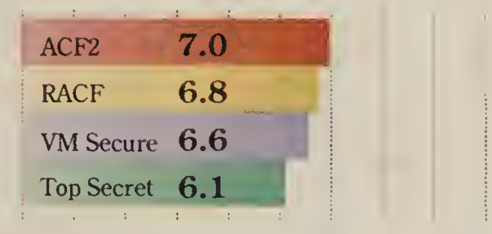
⑨ Efficiency of transaction control

Criteria importance rating: 7.7



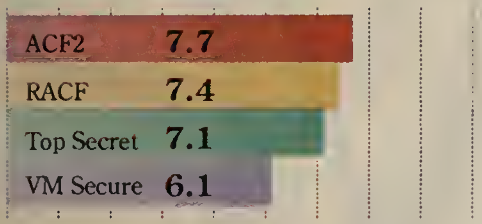
⑩ Quality of documentation

Criteria importance rating: 7.7



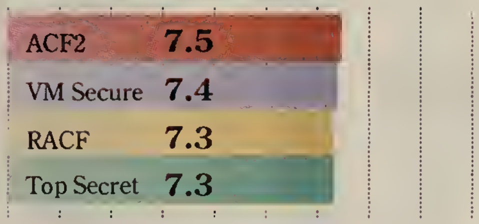
⑪ Performance of file discrimination functions

Criteria importance rating: 7.7



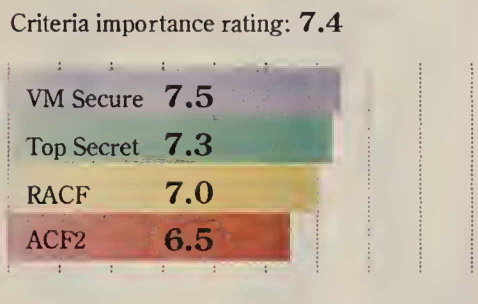
⑫ Efficiency of system maintenance access control

Criteria importance rating: 7.6



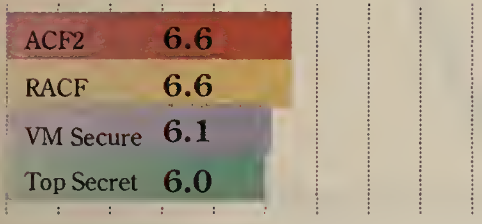
⑬ Ease of installation

Criteria importance rating: 7.4



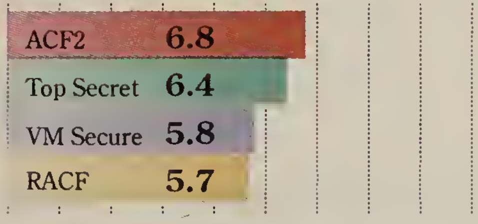
⑭ Pricing of installation and maintenance

Criteria importance rating: 7.1



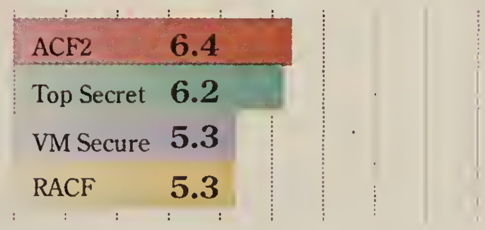
⑮ Effectiveness of training

Criteria importance rating: 7.0



⑯ Integrating with other security software

Criteria importance rating: 6.0



"Verbatim"

Responses are based on the most frequently stated answer to: "What do you like best/least about this product?"

ACF2

Likes	Dislikes
"Ease of use"	"Interfacing with other products"
"Flexibility"	"Maintenance"
"Provides needed access control"	"Poor support"

Top Secret

Likes	Dislikes
"Ease of use"	"Support from CA"
"Security it provides"	"Documentation"
"Flexibility"	"Interfaces to other products "

RACF

Likes	Dislikes
"Integration with IBM and other operating system functions"	"Reporting capabilities"
"It does the job"	"Hard to use"
"Support from IBM"	"Cumbersome"

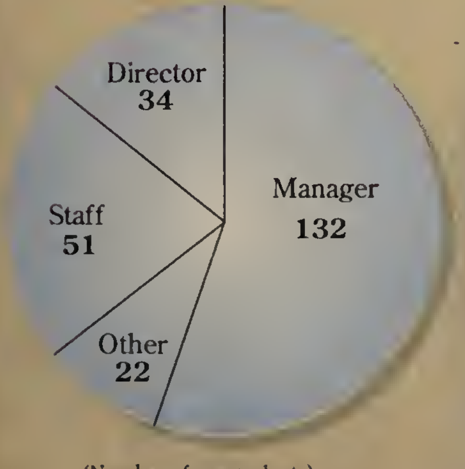
VM Secure

Likes	Dislikes
"Ease of use"	"Documentation"
"Directory management capabilities"	"Reporting/Auditing capabilities"
"Rules facility"	"Interfacing capabilities"

Vital statistics

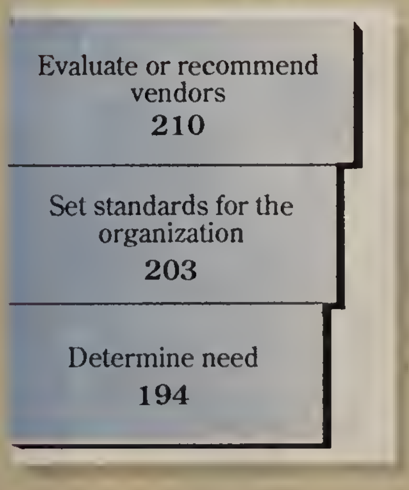
(Response base: 239, multiple responses allowed)

Who responded



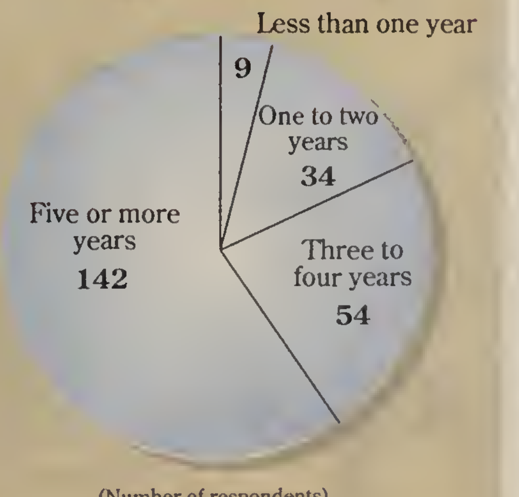
(Number of respondents)

Their responsibility for security products



(Number of respondents)

Time involved with security software



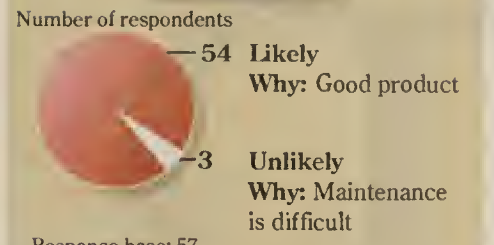
(Number of respondents)

Loyalties

Would you buy the product again?

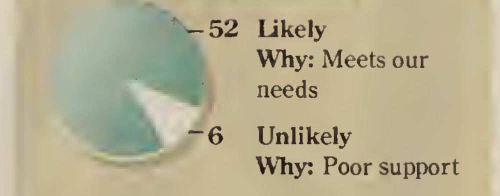
(Reasons based on most frequently stated responses)

ACF2



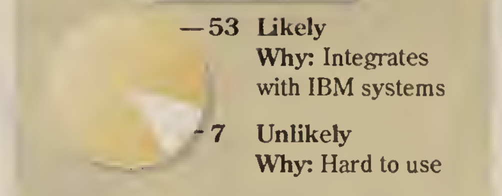
Response base: 57

Top Secret



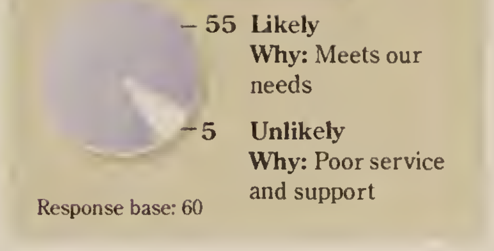
Response base: 58

RACF



Response base: 60

VM-Secure



Response base: 60

METHODOLOGY

Products rated in *Computerworld's* Buyers' Scorecard on mainframe access control software were chosen on the following basis: platform, the package's installed base and overall market share. The software had to run on IBM mainframes, be one of the top four access control packages in installed base and hold a substantial share of the market.

The ratings were based on telephone surveys conducted by First Market Research in Austin, Texas. Lists of users were provided by nonvendor sources.

The majority of ACF2 respondents use MVS Version 5.0 or higher. The majority of Top Secret respondents use MVS 4.2 or higher. The majority of RACF respondents use MVS 1.8 or higher. The majority of VM Secure respondents use VM 4.1 or higher. The processors used, in order of frequency, are IBM's 3090, 4381, 3081, 3084 and Amdahl Corp. systems.

The comparison involved phone survey results from a minimum of 60 respondents for each product. The weighted scores were computed by multiplying the mean scores all users assigned to each criterion by the mean scores of each user group.

Result tabulation was performed by IDG Research Services.

ACKNOWLEDGMENTS

Computerworld would like to acknowledge the assistance provided by the following: Marshall Austin, Advanced Information Management, Inc.; Jack Bologna, *Computer Security Digest;* Harold Highland, Elsevier Advanced Technology; Gerald Isaacson, Information Security Services; Sanford Sherizen, Data Security Systems, Inc.; Computer Intelligence; and Installed Technology International.

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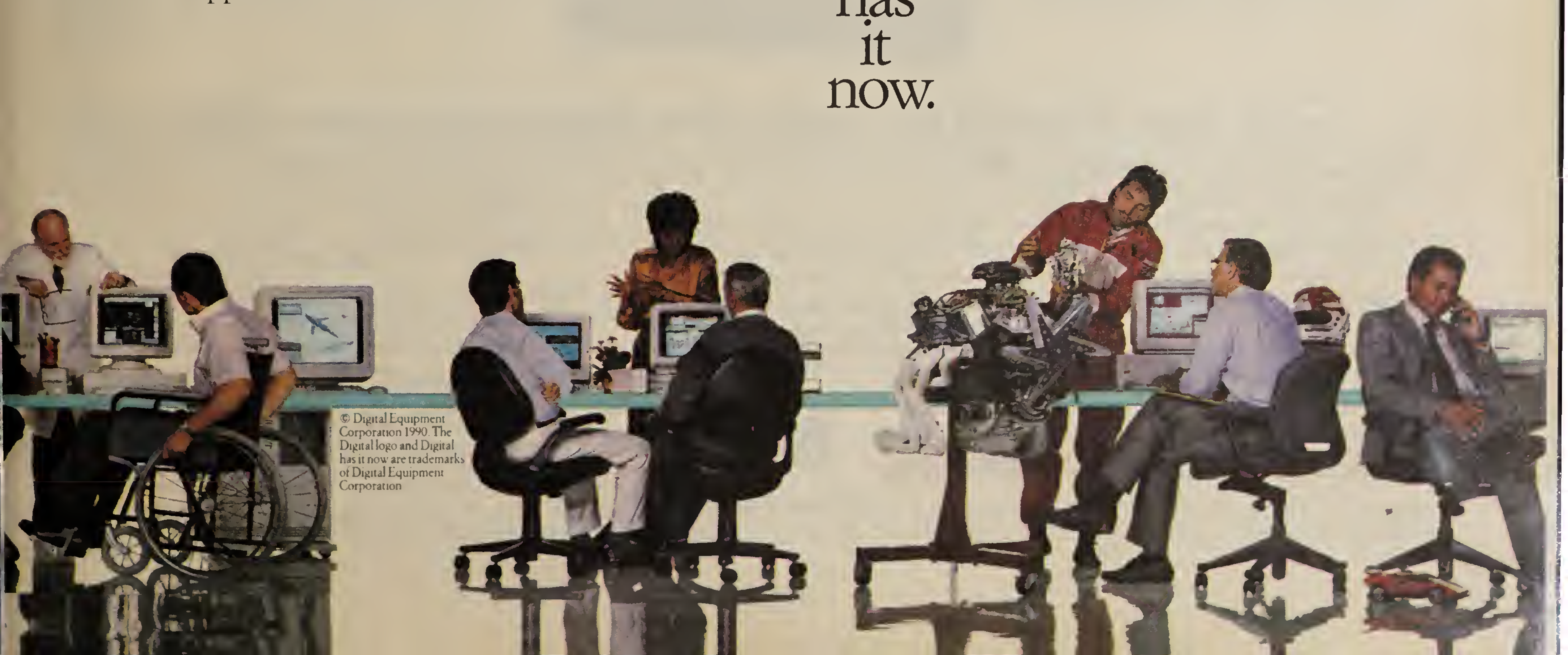

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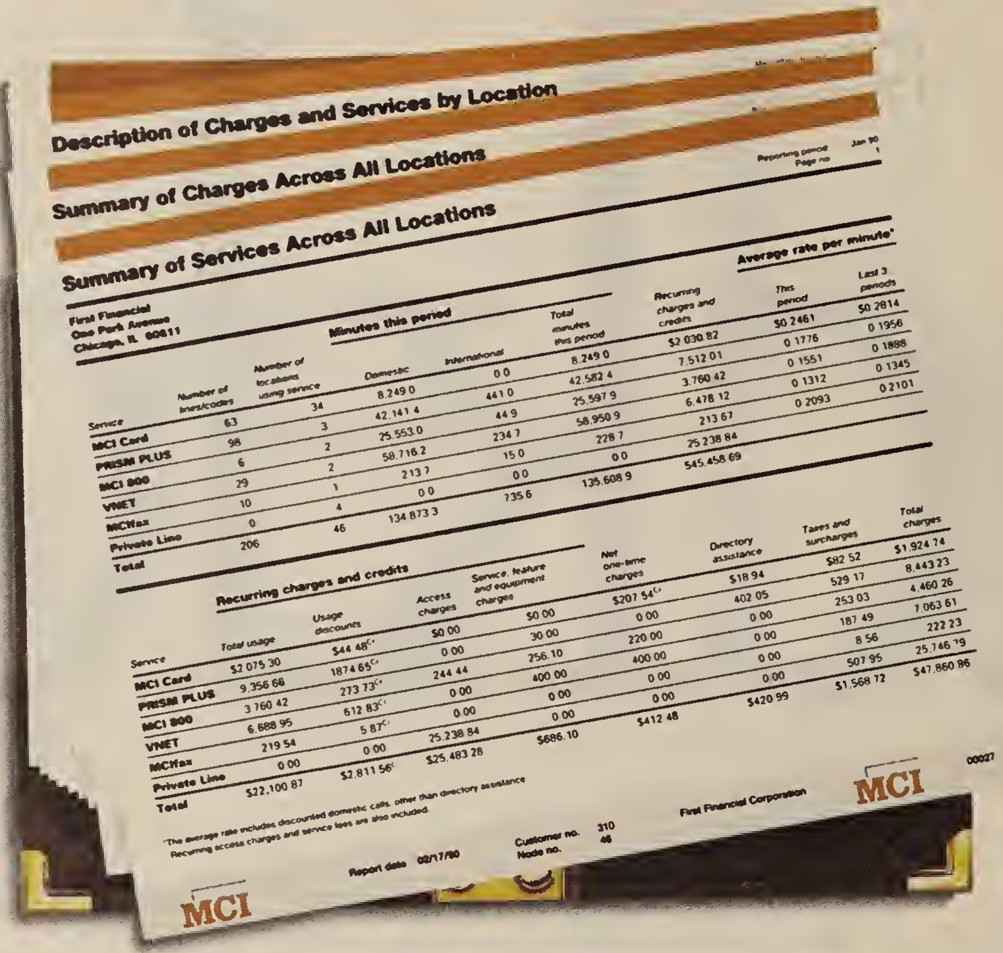

Description of Charges and Services by Location

Summary of Charges Across All Locations

Summary of Services Across All Locations

Reporting period Jan 90
Page no 1

First Financial
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			Minutes this period				Average rate per minute*	
Service	Number of lines/codes	Number of locations using service	Domestic	International	Total minutes this period	Recurring charges and credits	This period	Last 3 periods
MCI Card	63	34	8,249.0	0.0	8,249.0	$2,030.82	$0.2461	$0.2814
PRISM PLUS	98	3	42,141.4	441.0	42,582.4	7,512.01	0.1776	0.1956
MCI 800	6	2	25,553.0	44.9	25,597.9	3,760.42	0.1551	0.1888
VNET	29	2	58,716.2	234.7	58,950.9	6,478.12	0.1312	0.1345
MCIfax	10	1	213.7	15.0	228.7	213.67	0.2093	0.2101
Private Line	0	4	0.0	0.0	0.0	25,238.84		
Total	206	46	134,873.3	735.6	135,608.9	$45,458.69		

	Recurring charges and credits							
Service	Total usage	Usage discounts	Access charges	Service, feature and equipment charges	Net one-time charges	Directory assistance	Taxes and surcharges	Total charges
MCI Card	$2,075.30	$44.48Cr	$0.00	$0.00	$207.54Cr	$18.94	$82.52	$1,924.74
PRISM PLUS	9,356.66	1874.65Cr	0.00	30.00	0.00	402.05	529.17	8,443.23
MCI 800	3,760.42	273.73Cr	244.44	256.10	220.00	0.00	253.03	4,460.26
VNET	6,688.95	612.83Cr	0.00	400.00	400.00	0.00	187.49	7,063.61
MCIfax	219.54	5.87Cr	0.00	0.00	0.00	0.00	8.56	222.23
Private Line	0.00	0.00	25,238.84	0.00	0.00	0.00	507.95	25,746.79
Total	$22,100.87	$2,811.56Cr	$25,483.28	$686.10	$412.48	$420.99	$1,568.72	$47,860.86

*The average rate includes discounted domestic calls, other than directory assistance. Recurring access charges and service fees are also included.

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Network encryption hardware

VENDOR	PRODUCT	PROTOCOLS SUPPORTED	PHONE LINES SECURED	MAXIMUM BIT/SEC ACCEPTED	INTERFACES SUPPORTED[1]	ENCRYPTION STANDARD SUPPORTED[2]	KEY MANAGEMENT METHOD	OTHER FEATURES	UNITS INSTALLED	TRIAL PERIOD	BASE PRICE
American Computer Security, Inc. **(615) 883-6741**	Compsec II-Net One	Any supported by Novell Netware	Unlimited	10M	Ethernet, Arcnet	DES, proprietary	ANSI X9.17	Access log, disk storage, port contention control, user authentication	4,000	14 days	$595
Cryptall Communications Corp. **(401) 941-7600**	DPU-1000S	Synchronous	32	19.2K	RS-232C DCE and DTE	DES	ANSI X9.17	Access log, automatic bit/sec. setting, user authentication	150	30 days	$1,200
Cryptek/Gretag **(214) 349-6044**	Gretacoder GC-517X	Protocol-independent	*	64K	RS-232C DCE and DTE, CCITT V.35 DCE and DTE, RS-449, V.24	Proprietary stream cipher	Plug-in module for automatic key exchange after each transmission	None	1000	None	$7,500
	Gretacoder GC-518	Synchronous, fully transparent	*	19.2K	RS-232C DCE and DTE, V.24	Proprietary stream cipher	Plug-in module for automatic key exchange after each transmission	None	5000	None	$3,900
Cylink Corp. **(408) 735-5800**	CIDEC-LS	Protocol-independent	*	128K for synchronous, 19.2K for asynchronous	RS-232C DCE and DTE, CCITT V.35 DCE and DTE, Mil Std. 188, X.21/V.11, RS-422	DES	Proprietary public key, seek	Multidrop configuration, user authentication	2,000	Contact vendor	$2,250
	CIDEC-HS	Synchronous, DS-1, DS-2, G.703	*	8M	CCITT V.35 DCE and DTE, Mil Std. 188, X.21/V.11, RS-422, DS-1, DS-2, G.703	DES	Proprietary public key, seek	Network management system	3,500	Contact vendor	$10,475
	CIDEC-VHS	DS-3, CEPT 34M bit/sec., Sonet	*	50M	DS-3, CEPT 34M bit/sec.	DES	Proprietary or government-endorsed public key	Network management system	New product	Contact vendor	$17,500
Digital Communications Associates **(800) 241-4762**	DCA Secure LAN	Asynchronous, Netbios, SMR	*	10M	RS-232C DCE and DTE, Ethernet 802.3, Fiber Optics 10Base T	DES	Private, public	Access log, automatic bit/sec. setting, disk storage, user authentication	NP	None	$1,595 per node
Digital Equipment Corp. **(800) 344-4825**	Digital Ethernet Security Network Controller	Ethernet, 802.3	*	10M	Ethernet, 802.3	DES	Keypad, encrypted management	Access log, policy specification	NP	Contact vendor	$7,176
Fischer International Systems Corp. **(800) 237-4510**	RSA/3270	Asynchronous, SNA/SDLC, X.25	32	19.2K	RS-232C DCE	DES, RSA	RSA	Access log, automatic bit/sec. setting, port contention control, user authentication	New product	Contact vendor	$30,000-$50,000
GN Telematic, Inc. **(800) 468-8353**	Safematic Security Module	Protocol-independent	*	9.6K	RS-232C DTE, RS-422	DES, RSA, custom	ANSI X9.17, proprietary	Access log, audit and surveillance logs, user authentication	12,000	60 days	$900
Hughes Network Systems **(619) 452-4657**	LC-76	Synchronous	Up to 48 T1 lines	6M	CCITT V.35 DCE and DTE	DES	X9.17, proprietary	None	800	None	$5,500 for single channel, $9,000 for dual redundant channel
	LC-76 CF	Synchronous	*	128K	RS-232C DCE and DTE, CCITT V.35 DCE and DTE, RS-422, V.11	DES	X9.17, proprietary	None	475	None	$5,200 for single channel, $8,000 for dual redundant channel
Information Resource Engineering, Inc. **(301) 931-7500**	Dial, Link, X.25 and SNA Encryption Systems	Protocol-independent	Up to 512	64K	RS-232C DCE and DTE	DES	ANSI X9.17	Access log, automatic bit/sec.setting and key management, disk storage, port contention control	5,000	30 days	$525
Intellicom, Inc. **(818) 407-3900**	Microcipher	Asynchronous	*	19.2K	RS-232C DCE and DTE	DES	Automatic exchange of keys at start of session	User authentication	500	30 days	$499
Jones Futurex, Inc. **(916) 635-3972**	Secure SNA with Enc-324	SNA/SDLC	*	9.6K	RS-232C DTE	DES	Automatic exchange of keys at start of session	Automatic bit/sec. setting, device authentication, disk storage	2,500	60 days	$595 for Secure SNA, $635 for Enc-324
	Enc-400 Asynchronous Link Encryptor	Asynchronous	*	9.6K	RS-232C DCE and DTE	DES	Automatic exchange of keys at start of session	Access log, automatic bit/sec. setting, device authentication	500	60 days	$595
Microframe, Inc. **(201) 494-4440**	DL 4000	Asynchronous	4000+	3K	RS-232C DCE and DTE	DES	ANSI X9.17	Access log, automatic bit/sec. setting, user authentication	200	30 days	$4,850 for chassis plus $500/line
	Cipher Key	Asynchronous	*	3K	RS-232C DCE and DTE	DES	ANSI X9.17	Access log, automatic bit/sec. setting, user authentication	200	30 days	$400
Newbridge Networks, Inc. **(703) 834-3600**	2601 SC Main Street	2B&D	*	64K for synchronous, 19.2K for asynchronous	RS-232C DCE and DTE, V.24, V.28	DES, cipher feedback	Public key cipher feedback, Diffie-Hellman	User authentication	New product	Contact vendor	$1,200
	Secom 1000	Asynchronous	*	19.2K	RS-232C DTE	Discrete exponentiation	Public key cipher feedback, Diffie-Hellman	Digital signature, user authentication	New product	Contact vendor	$750
Pailen-Johnson Associates **(703) 442-9051**	LEAD[3]	Asynchronous	1,024	9.6K	RS-232C DCE and DTE	Proprietary government standard	Smart card	Access log, user authentication	New product	None	$500
	Secureware Jr.	Asynchronous	*	19.2K	RS-232C DCE and DTE	Proprietary	Authorized user key	User authentication	200	30 days	$195
Racal-Guardata, Inc. **(703) 471-0892**	X9 Cryptoserver	Protocol-independent	Controlled by application	20K	Ethernet, TCP/IP	DES	ANSI X9.17	Access log, user authentication	50	None	$25,000
	Personal Computer Security Module	Protocol-independent	Controlled by application	30K	IBM PC-bus interface	DES	ANSI X9.17	Access log, user authentication	500	None	$1,125
	CAT-2000 Cryptographic Authentication Terminal	Asynchronous	Controlled by application	19.2K	RS-232C DCE	DES	ANSI X9.17	Automatic bit/sec. setting, user authentication	600	None	$495
	ISM Information Security Module	Asynchronous, BSC, synchronous, SNA/SDLC	*	9.6K	RS-232C DCE	DES	EEPROM Key Transport, Master/Session Key	Automatic bit/sec. setting	3,000	None	$2,195

All products encrypt data, except those from Newbridge Networks, Inc., which encrypt both data and video; American Computer Security, Inc., which encrypt both data and voice; and the LC-76 from Hughes Network Systems, which encrypts data, voice and video communications.

[1] DTE — Data Terminal Equipment; DCE — Data Circuit Terminating Equipment; CCITT — protocol standard of the International Telecommunications Union.

[2] DES — Data Encryption Standard published by the National Bureau of Standards; RSA — Rives-Shamir-Adleman encryption algorithm.

[3] Pailen-Johnson Assoc.'s LEAD is sold to government agencies and approved contractors only.

*Product performance is not a function of number of phone lines supported, but of the speed at which data is transmitted.

The companies included in this chart responded to a recent survey conducted by *Computerworld*. When a vendor is unable to provide specific information about its product, the abbreviation NP (not provided) is used. When a question does not apply to a vendor's product, the abbreviation NA (not applicable) is used. Further product information is available from the vendors.

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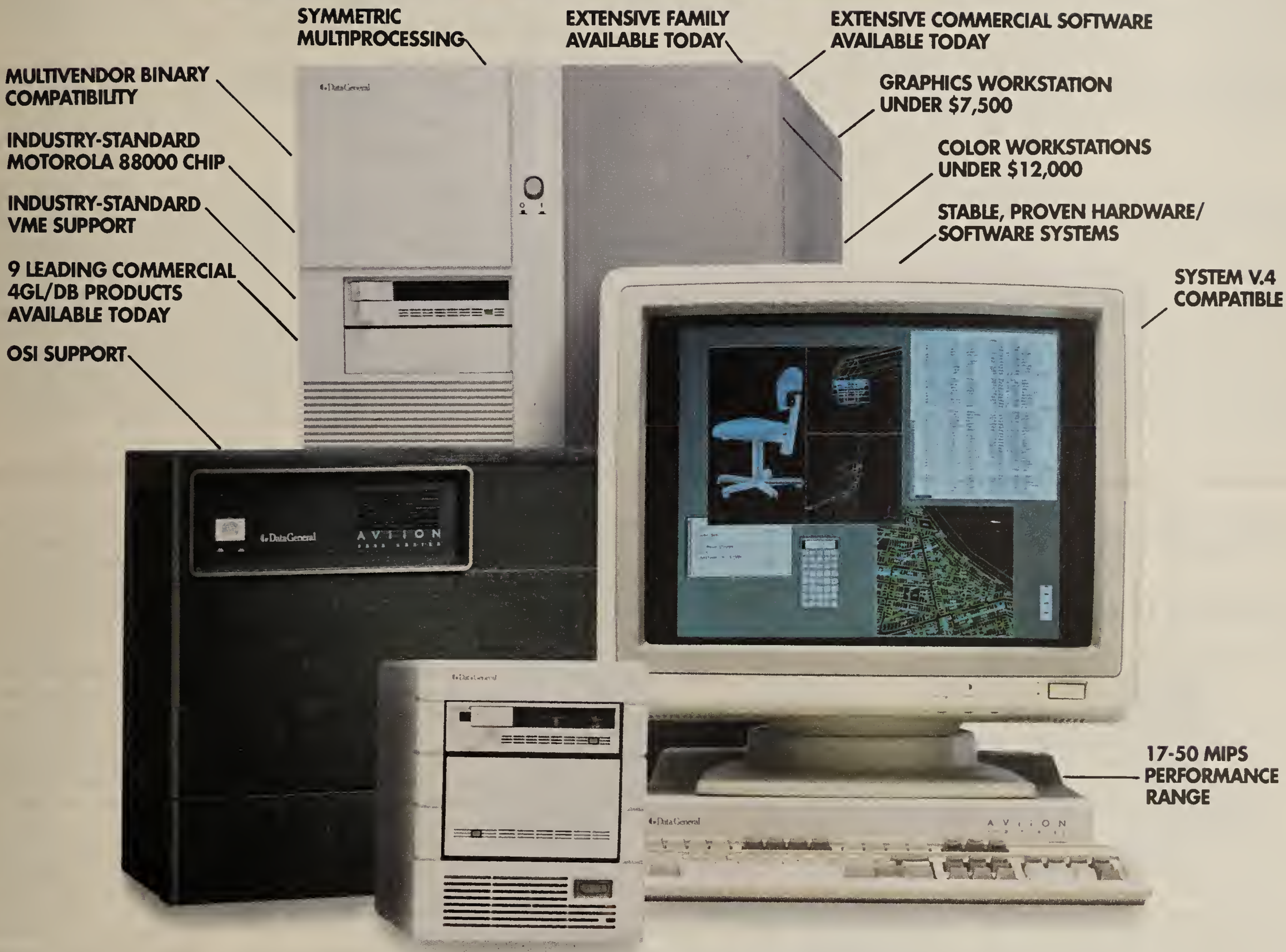
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VENDOR	PRODUCT	PROTOCOLS SUPPORTED	PHONE LINES SECURED	MAXIMUM BIT/SEC ACCEPTED	INTERFACES SUPPORTED[1]	ENCRYPTION STANDARD SUPPORTED[2]	KEY MANAGEMENT METHOD	OTHER FEATURES	UNITS INSTALLED	TRIAL PERIOD	BASE PRICE
Racal-Milgo **(305) 846-1601**	Datacryptor 64, 64C, 64-1027, 64-1027C	Protocol-independent	*	64K	RS-232C DCE and DTE, CCITT V.35 DCE and DTE, V.11 DCE and DTE	DES, RSA	ANSI X9.17	Centralized key management, facsimile encryption	20,000	30 days	$1,900-$2,400
Sector Technology, Inc. **(703) 379-1800**	Sentinel Microcomputer Security System	Protocol-independent	Files, not phone lines, are secured	Network-dependent	NA, device is installed inside the PC	DES, proprietary	On-line verification at session or system level	Access log, user authentication, audit trail, menu interface	1,500	30 days	$465-$495
Secure Telecom, Inc. **(408) 992-0572**	Multifunction Encryptor	Asynchronous	*	9.6K	RS-232C DCE, RS-232	DES	AT command, stored encrypted	Built-in V.22 BIS modem and 2-port multiplexer, disk storage	200	Distributor option	$795
Telcor Systems Corp. **(508) 653-3995**	3196AD	Asynchronous	*	38.4K	RS-232C DCE and DTE	DES	Key physically input or downloaded by server	None	NP	30 days	$795
	3124AD	Asynchronous	*	9.6K	RS-232C DCE and DTE	DES	Key physically input or downloaded by server	None	NP	30 days	$595
Western Datacom **(800) 262-3311**	MESA 432	Asynchronous	*	19.2K	RS-232C DCE	DES	ANSI X9.17	Automatic bit/sec. setting, port contention control, user authentication, integral V.32 modem	NP	30 days	$1,595
	432 Crypto Card	Asynchronous	*	19.2K	RS-232C DCE	DES	ANSI X9.17	Automatic bit/sec. setting, port contention control, user authentication, integral V.32 modem	NP	30 days	$1,395
	MESA 424	Asynchronous	*	9.6K	RS-232C DCE	DES	ANSI X9.17	Automatic bit/sec. setting, port contention control, user authentication, integral V.22 modem	NP	30 days	$995
	424 Crypto Card	Asynchronous	*	9.6K	RS-232C DCE	DES	ANSI X9.17	Automatic bit/sec. setting, port contention control, user authentication, integral V.22 modem	NP	30 days	$895
Xerox Corp. **(703) 442-6777**	Xerox Encryption Unit	Ethernet, IEEE 802.3	Up to 1,000	220 packet/sec.	Ethernet	DES	Proprietary	Access log, user authentication	NP	None	$4,995

With tokens, it's a new password every time

HAROLD JOSEPH HIGHLAND

Even the most obscure words in the English language are ineffective passwords if a determined intruder makes a dictionary attack on your password system. If it's in the dictionary, it will be systematically tried.

However, creating and managing an impenetrable password system is not an easy task (see story page 89). Getting users to choose good passwords, remember assigned ones, keep them confidential and change them periodically is difficult enough that some companies are seeking other means of controlling access.

One strategy that has been used by the military and is making some progress in the commercial market is dynamic password generators, also known as tokens. These devices rule out the need to choose an effective password because they never use the same password twice. In addition, they add a layer to the access process; to log on, the user needs both something he knows, a personal identification number, and something he possesses, the token.

About 20 vendors currently market these handheld devices, each of which contains a microprocessor, battery and LCD readout and ranges in price from $30 to $100 per unit. Four vendors' products, however, lead the market: Enigma Logic's Multisync and Access Card; Racal-Guardata's Watchword; Digital Pathways' Securnet Key; and Security Dynamics' Securid. Token software, which can reside on a mainframe, minicomputer or personal computer, is customized for each installation and thus ranges in cost.

The first three vendors' devices are about the size of a small calculator with a numeric keypad and use a "challenge-response" strategy. The user logs on to his terminal using a personal identification number, and the computer responds with a "challenge" — a single digit or series of digits on the terminal screen — which the user keys into the token.

The handheld device performs a computation on the challenge based on an algorithm assigned specifically to that token. When the token displays the result, or "response," the user enters it into the terminal's keyboard. Meanwhile, the mainframe, which also knows the algorithm, has performed the same computation. If both responses match, the user's identify is verified.

Random seeds

Security Dynamics' device is the size of a credit card and operates on a random-number basis. When the system is set up, a starting number, or "seed," is assigned to the token and recorded on the mainframe.

To access the mainframe, the user first enters his personal identification number and then the random number generated by the device, which changes every 60 seconds. The mainframe verifies the authenticity of the personal identification number and then refers to its reference table to find the seed as well as the date and time that the seed was put into the token. Using an algorithm, the computer determines what number the token should have displayed and compares it with the number entered.

Even if the device is lost or stolen, other built-in features inhibit illegal access. The software for each token allows only a certain number of log-on attempts before locking out the user.

Some token software also includes an audit trail and a built-in alarm that alerts the security director or mainframe operator to illegal access attempts. Some software can be customized to provide data on files accessed as well as exception reports.

While tokens have been available for more than a decade, early releases were somewhat unreliable. Battery failures and other malfunctions wreaked havoc when users would return from lunch only to find that they weren't recognized by the system. While recent improvements have made these devices more acceptable for general use, these devices pose some drawbacks.

One problem is the tiny keyboards on the challenge-response devices. For anyone with medium-size fingers, it is very difficult to punch in a number on the half-centimeter-square numbers without hitting the key next

Continued on next page

	Enigma Logic's *Multisync, Access Card*	**Racal Guardata's** *Watchword Generator*	**Digital Pathways'** *Securnet Key*	**Security Dynamics'** *Securid*
Dimensions (in.)	3.3 x 2.1 x 1.25	4 x 2.25 x .25	3.6 x 2.25 x .3	3.3 x 2.1 x 2 mm
Built-in alarm	Customizable	No	Yes	Duress alarm
Operating system	All (except Mac, AS/400, OS/2)	DOS, Xenix	MVS, RACF, ACF2	VMS, MVS, Unix, RACF, ACF2, Top Secret, C, Unicos, NC-Path
Battery life/ User-replaceable	3 years/No	3 years/Yes	3 years/Yes	5 years/No
Hardware price (per token)	$40/$30	$85	$50	$50
Software price	$275 (PC)[1]	$995 (PC)[2]	[3]	$12,000-$28,000[4]

[1] Average of $68 per user on larger systems

[2] Includes two tokens, PC module and Watchword Controller software

[3] Uses Cybermation's Blockade or Enigma Logic's Safeword. Tokens also work with Racal Guardata's call-back modem, Defender. Modem prices vary from $6,500 (four phone lines) to $25,000 (96 phone lines)

[4] Accommodates 16 modems or terminals

Highland is managing director of Compulit's Security Laboratory in Elmont, N.Y., and editor in chief of *Computers Security*, an international journal.

Continued from previous page

to it, which is about 4mm away. Many people resort to using an implement such as a pencil eraser or even a cuticle stick.

The problem is not just reduced accuracy. On the challenge-response type of token, you have only a limited amount of time to key in the challenge to the device and respond to the mainframe. If you exceed the time limit, you are automatically logged off. If you miss three times, the system locks you out.

While some token software can be adjusted to lengthen the response limit, too lengthy a duration will compromise security. Limiting time is another good method of screening an intruder who is inexperienced with the token.

Battery life is another ongoing concern. A typical battery will last five years, but the security director should always keep a log to anticipate replacements. On units with embedded batteries, the entire token must be replaced.

The more severe problem posed by faulty or worn-out batteries is that the user cannot access his system. In other cases, the user might forget or misplace the token, or it might be stolen. In the last case, the security director needs to deactivate the user's account.

Because it is inevitable that an employee will at some point leave a token in another pocket or purse, the security administrator must keep spare tokens available.

Like passwords, the use of tokens can overlook the fact that most computer-related crimes or errors are committed by authorized users. Software may someday be available to support tokens, adding a third layer to the access control system. They could protect highly classified files by challenging any user attempting access. If you assign tokens only to users who should see these files, you could screen out unauthorized access. •

Password puzzlers

Password systems are only as secure as passwords themselves. Unfortunately, the words that most users choose for ease of recall are as easy for intruders to guess.

One survey, conducted several years ago at a government agency, found that 43% of the agency's 1,500 employees used two-character passwords (probably their initials), and over 25% used a single character. Compliance with good practice is no better in business. A survey of 50,000 users in several private companies revealed that about 20% used a single character.

Assigning passwords to users doesn't help. They tend to write them down, which defeats the purpose altogether.

Passwords don't have to be long or meaningless to be obscure. Some kinds of choices that could foil intruders but still be easy for users to recall include the following:

- Words from another language, such as the Danish "*bedanked*" or the Finnish "*kiipos,*" meaning "thanks."
- Family names. Go back as far as your grandmother's or great-grandmother's maiden name, but avoid someone as close as your own mother.
- Obscure towns from other countries. However, be sure to use the original spelling, not the Americanized version. Names of towns are in dictionaries, which intruders often use to forge a password attack.
- Existing words, but with one or more letters changed, added or repeated. For example, "huney" (honey) or "grannd" (grand).
- Run two existing words together and add a control character, such as "poor&boy" or "rich@gal."

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Network Systems

How to avoid the five biggest downsizing errors

Shifting to smaller platforms need not be a large-scale headache

BY THEODORE P. KLEIN

While it's true that downsized systems are less expensive to develop or administer than mainframe systems, they're certainly no less complex. The downsizing process is not as simple as setting up a number of personal computers or local-area networks with individual productivity applications, yet many organizations approach the process as if it were.

Downsizing mainframe-based applications systems onto smaller, more discrete workstation- or LAN-based platforms is a complex task. The potential benefits are also great — cost-efficiencies, service improvements, competitive advantages and other bottom-line benefits. To succeed in downsizing, information systems staff and key line managers must carefully consider and sort out a wide variety of hardware, software, communications, personnel, business strategy and business function issues.

Downsizing is more than just platform migration; it can also represent a total change in the way IS is identified, developed and deployed throughout the organization.

Effective downsizing is a complex systems integration issue of matching business functions with new technology. However, the rapid changes of this new technology, continued growth of user capabilities and organizational politics related to control of the IS resource can also complicate a downsizing effort.

As a result, IS managers, too often caught up in the excitement of today's workstation-based technology, make indiscriminate, short-term and poor strategic decisions.

By familiarizing yourself with the following five common errors that many organizations make in a downsizing effort, you can take the necessary steps to ensure success.

1. No management commitment. Far too many IS organizations begin their downsizing effort without management understanding or commitment; others begin with only a vague sense of management support. Neither is adequate. To ensure downsizing success, you must obtain the express commitment of both corporate and line management. This commitment includes budget approval from line managers in whose areas the systems will ultimately be located.

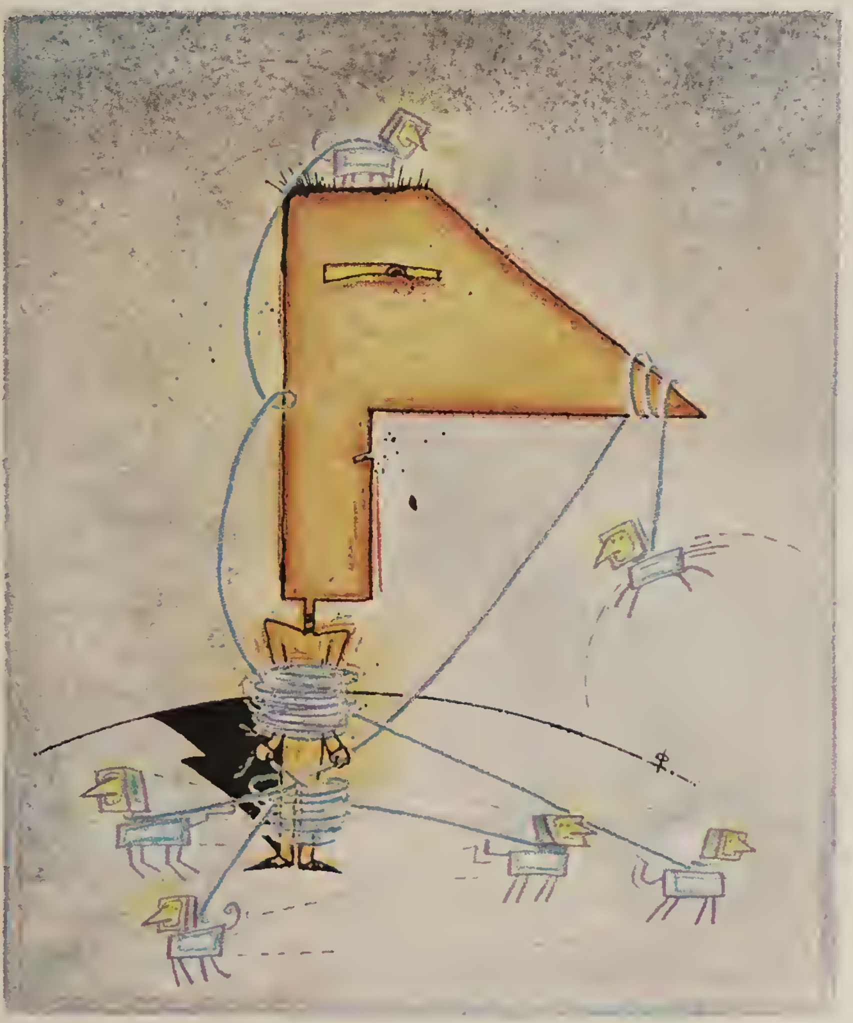
Let's start with corporate management. At the very highest level, you must ensure that corporate management accepts the concept that information technology has value well beyond strictly automating the business.

In fact, in the best of all possible worlds, corporate managers will not merely accept the inherent value of information technology; they will also promote it. They will see information technology as a fundamental component of long-range corporate strategy and as an enabler of new business strategies.

You must also ensure that corporate management supports the idea of an information technology community within the organization. Unlike the fortress mentality typically associated with centralized mainframe IS, this downsized community will cut across functional departments and organizational divisions. However, it will still remain a community — integrated, synchronized and functioning under uniform policies. Corporate management must also be involved in establishing the business principles on which these community policies are to be developed.

Not surprisingly, it costs money to maintain an information technology community. As information technology responsibility shifts, departmental operating costs rise. In a downsized environment, individual departments are no longer insulated from information technology costs; in most cases, they are responsible for them. That's why you must obtain clear budget approval of corporate management before beginning any downsizing effort.

Now, assuming you have



David Povilaitis

Klein is founder and president of the Boston Systems Group, a consulting, training and systems development firm based in Boston.

- **Don't let technology dazzle you**
- **Downsizing affects the whole organization**
- **Key: Know your organization**

obtained corporate support, you need to obtain line management support.

Why? Because in a downsized environment, line managers have greater responsibility, greater authority and greater accountability. The day-to-day synchronization of downsized systems will increasingly become their responsibility.

You'll find many line managers who are enthusiastic about downsized systems — especially if they manage a group of more experienced information technology users who now develop their own applications. Use their enthusiasm to build support for the downsizing effort. Whether you first obtain a high-level strategic commitment or a more tactical line management commitment really doesn't matter. Both are necessary — and both must precede all other downsizing efforts.

> IN THE BEST of all possible worlds, corporate managers will not merely accept the inherent value of information technology, they will promote it.

2. Inadequate understanding of existing information technology infrastructure. You can't plan for a downsizing effort if you don't understand your organization's overall position on information technology and the constraints imposed by your current technical, political or personnel environment. Downsizing can radically alter any organization's information technology infrastructure, so you must know what that infrastructure is before you go about altering it.

Generally speaking, if you can answer the following questions, you have an excellent grasp of the organizational context in which your downsizing effort is to take place — and a greater chance of success.

On overall corporate position:

- What are the key strategies and tactics in place for you to achieve corporate goals? How have these strategies and tactics been deployed within each operating division? What are your critical success factors to accomplish these goals?
- Is the corporation growing? Shrinking? Are acquisitions under way? Are you in a cost-control mode? What's your relationship to the competition, and what are they doing?
- What broad technology principles guide your organization's use of information technology? For example, does the organization place an emphasis on a single-vendor environment, or is the policy to select the best product given the business situation?
- How, specifically, does your organization use information technology? To automate? To improve effectiveness? To radically alter day-to-day operations? How does it wish to use information technology over the long term?

On distributed use of information technology:

- How many functional departments now use information technology on their own? In what capacity? What exactly are they doing? What technologies or applications have they deployed?
- What, specifically, is their cross-functional involvement?

On the applications portfolio:

- What, specifically, is in your organization's applications portfolio?

Keeping it all together

If you're wondering how you will go about standardizing an entire network of newly downsized applications, take heart. It's often easier to put a controlling framework into place when you first embark on a downsizing effort than to later overlay that same framework on an existing proliferation of dispersed technologies.

In general, your guiding principle should be to devise a framework that's coherent, consistent, uniform and synchronized — throughout the organization as well as in individual, departmental and enterprise systems. Such a framework should include the following:

- Community development guidelines — simple, direct statements of how your organization wishes to use information technology over the long term.
- Accepted business application architectures — easy-to-understand diagrams of specific application architectures that have been tested and accepted for corporate use.
- Building costs — straightforward statements of the system requirements that must be in place before a network "occupancy permit" will be issued.

If you implement the framework in this way, then those responsible for individual, departmental and enterprise systems will know, unambiguously, whether their downsized systems fall within corporate guidelines.

THEODORE P. KLEIN

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- To what extent can you categorize those applications as enterprise, departmental or individual systems?

On the user community:

- What, specifically, is the experience of your user community? Can you rank the users in your various corporate departments according to their information technology knowledge, capabilities, responsibilities and interests?

3. An inappropriate organizational structure and resources. Before beginning a downsizing effort, you must ensure that you have an appropriate organizational structure. There must also be appropriate technical personnel to develop, implement and maintain your downsized systems. Downsizing uses new hardware technologies, new operating systems and new software products, as well as innovative development methodologies such as rapid application development and incremental design. Integrating these novel concepts is a key criterion for successful downsizing.

In some cases, this means a reorganization of the IS department. In a general IS structure for supporting downsized and distributed information systems, the IS organization consists of the following three units:

> DOWNSIZING uses new hardware technologies, new operating systems and new software products, as well as innovative development methodologies such as rapid application development and incremental design.

- The Corporate Operations group manages the corporate communications network and is responsible for maintaining existing mainframe hardware and operations.
- The Specialized Services group is a key group of internal consultants that sets up the guidelines, methodologies and development environments, providing overall leadership for dispersed applications development.
- The Enterprise Systems Development group continues to operate, develop and maintain enterprise systems, whether they are developed on mainframes or workstations.

This means that a component of the existing IS staff needs to be moved away from traditional Cobol- and IMS-type environments and into the use of workstation and LAN development tools — a challenging, yet vital, initiative.

Within each corporate division, there is a technical officer and a local facilitator. The local facilitators report to the technical officers, but they have dotted-line responsibility to the Specialized Services group.

Why? Because it is the local facilitator's charter to develop dispersed systems — taking them off the mainframe and redeploying them on the network. Specialized Services is also responsible for ensuring that these newly dispersed systems share common architectures and frameworks so they can be adapted as necessary to business and corporate changes.

4. Trying too much too quickly. Many information systems managers make the mistake of attempting an immediate, large-scale downsizing effort. They take a key enterprisewide application and, in an attempt to gain monumental improvements, strive to re-engineer and redeploy it on workstation- and LAN-based platforms. They could not make a bigger mistake.

Instead, it's better to start with a small pilot engagement of realistic size — given your experience with the technology and existing staff skills.

You should also perform that pilot on applications that are fairly self-contained, without too many cross-departmental links, dependencies or interfaces. Then, you'll be more available to experiment and adjust as necessary. What's more, if your pilot is delayed or unsuccessful, it won't have a major impact on the business function.

If, on the other hand, your pilot is successful, you can apply that success to a larger downsizing project.

Of course, before you begin in earnest, you should carefully determine the human resource requirements for all identified tasks and develop a realistic master schedule for completion. You should also realize — at the front end — that it can take from one to four years to fully accomplish a systematic and successful downsizing effort throughout a large organization.

5. No controlling framework or infrastructure. Although it sounds obvious, it's a mistake to begin a downsizing effort without first determining a controlling framework for your new systems. Many information systems managers erroneously assume that because systems are being downsized, systems always work within a centralized corporate framework. The more dispersed the technology and the people are, the more important coordination, coherence and consistency become — especially as power users and similar constituencies start deploying sophisticated departmental systems of their own.

No one ever said downsizing would be easy. But if you can avoid these five common errors, you're well on your way to a successful effort — especially if you also have strong IS leadership and good cross-organization communication. •

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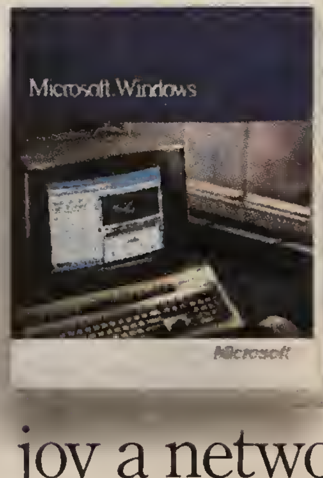

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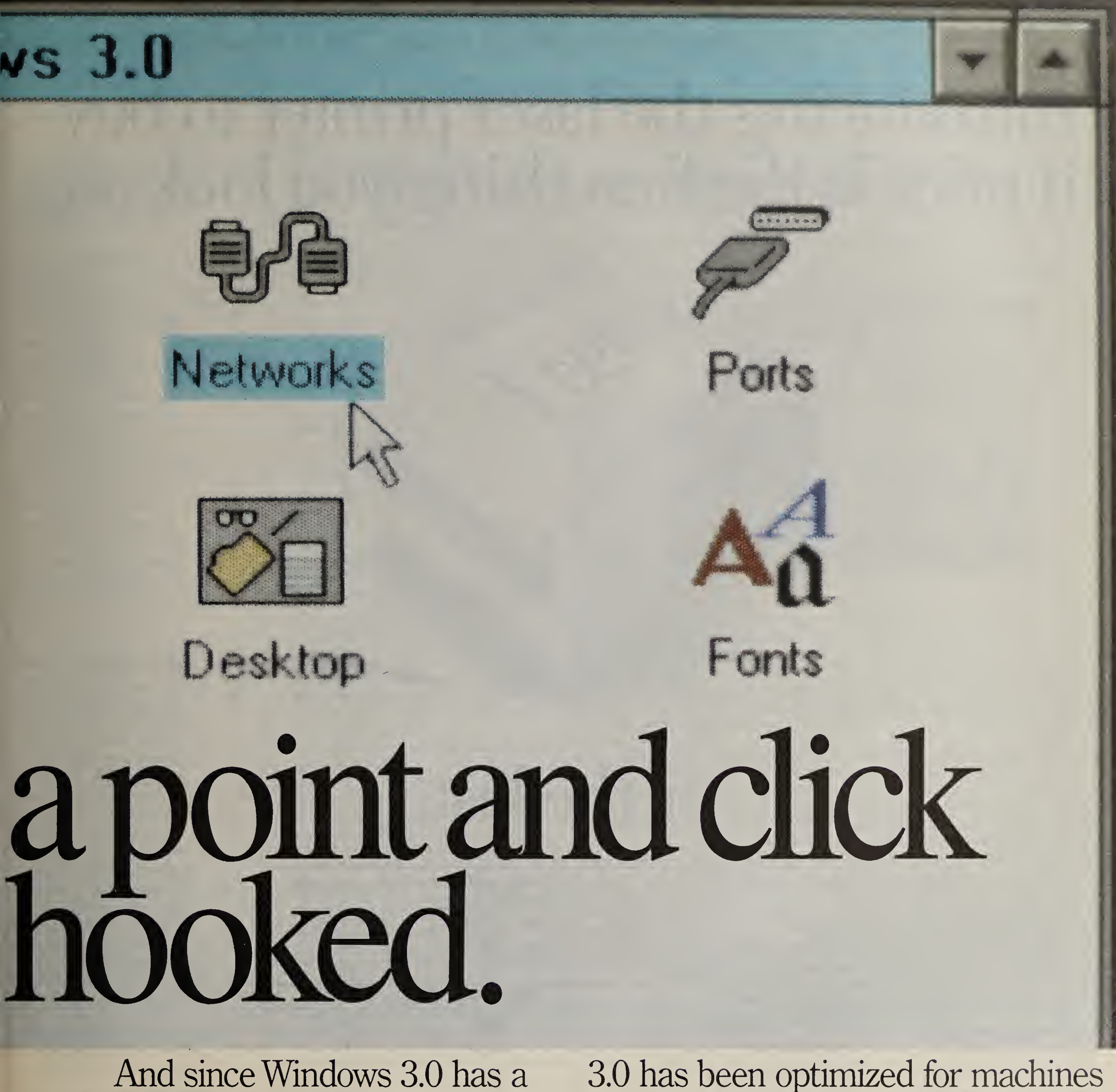

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NATIONAL BRIEFS

Class reunion

Back in the late 1970s, when The Beach Boys were singing "Let's get back together and do it again," **Dan Bricklin** and **Robert Frankston** were busy creating Visicalc, the product that detonated the personal computer spreadsheet explosion of the 1980s. Now, the former partners are following the Beach Boys' advice: This time, Bricklin and Frankston are teaming up to design software for pen-screen PCs, which are currently under development at Scottsdale, Ariz.-based **Slate Corp.**

……

Fewer hands on DEC

Digital Equipment Corp. last week upped its estimate of the number of employees expected to say yes to a voluntary severance program now in force and running until the end of this month. In April, DEC speculated that some 2,000 employees would swap their jobs for the benefits package being offered by the company in an attempt to trim costs while avoiding layoffs. Now, according to a company spokesman, it looks like the total will run closer to 2,400 employees.

More national briefs on page 99

Who needs on-site child care?

SAS Institute says it does, others do — you may need it too

BY SALLY CUSACK
CW STAFF

Miranda Drake had been separated for two years before her divorce was finalized in March. Now in the role of single parent to her two small children, Drake, an administrative assistant, said she would have been forced to stop working if her employer had not provided on-site child care as part of her overall employee benefit package. "It was a lifesaver," she said.

David Tyree, a publishing programmer/analyst and a single parent with two children, also depends on on-site day-care facilities to help balance the load. His 4-year-old daughter, Jeannette, is thriving in her day-care program, he added.

Trish Dowty, a purchasing manager with two little girls, said that her second child might not have been a possibility for herself and her husband had on-site day care not been available through her employer.

Drake, Tyree and Dowty all work at SAS Institute, Inc., a $205.6 million, privately owned software company based in Cary, N.C. Creator of the SAS System, a statistical system software package capable of running on a variety of hardware platforms, SAS became one of the first U.S. corporations to provide on-site day-care services for the children of its employees when it opened a child-care center in 1981.

Employees pay for the children's lunches and snacks, which come to about $2 per day. All other operating costs are absorbed by SAS.

However, parents are not the only ones benefiting from the program. According to Lynne Donges, manager of public affairs, SAS has a 7% employee turnover rate, considerably lower than the average 25% reported by most comparably sized U.S. firms.

"When we first opened the day-care [facility], turnover rates in the computer industry were tracked at 32%," Donges said. "We're answering the needs of a very young work force." Figures indicate that the average SAS employee is 33 years old.

SAS responded to the turnover problem that threatened to hobble the quickly growing software industry with a day-care effort that began with six children. In 1985, the firm opened a second center to keep pace with company growth and increased child-care needs among the staff.

Continued on page 99

The Need:

- As of the mid-1980s, midsize-to-large U.S. firms were reporting annual turnover rates of approximately 25%.
- In the particularly youth-oriented computer industry, the figure was approximately 32%.
- Some 16% of the 1,400 employees at software maker SAS Institute's Cary, N.C., headquarters — a work force whose average age is 33 — take advantage of the firm's on-site day-care facilities.

Indeed:

- According to figures compiled by the Families and Work Institute in New York, approximately 1,200 U.S.-based companies now have on-site child-care facilities.
- As of this year, approximately 5,400 U.S. employers with work forces of more than 100 provide child-care assistance in some form.

Sources: SAS Institute, Inc. and the Families & Work Institute

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Calculating for a better world

Abacus combines altruism and capitalism into a unique endeavor

BY JIM NASH
CW STAFF

Cindy Charles

Abacus' *(clockwise from top left) Starnes, Sumike Saulson, Tulp, Konigsberg and Tresky run a company with a difference*

SAN FRANCISCO — Abacus, Inc. would seem out of place in almost any setting other than San Francisco's Haight District.

The Haight, after all, remains a citadel for eclectic minds willing to make unorthodox sacrifices for far-reaching personal and universal goals. It was in this district in 1973 that Way Konigsberg and two friends conspired to replace the juggernaut model of corporate success with a more agile and benevolent working model.

In Konigsberg's words, they set out to build a "creative, innovative alternative to corporate philanthropy." Seventeen years later, Abacus is a $10 million computer reseller and custom-software developer that allocates 10% of its pretax profit to Project Pass, a multifaceted nonprofit organization.

Along the way, Abacus has chalked up some respectable growth figures. Abacus principal Claire "Lee" Tulp claimed that the privately held company has tripled gross revenue on five occasions since incorporating in 1979.

KONIGSBERG RECALLED a refrain most start-ups grow tired of: No equity, no experience, no loan.

While gross revenue of $10 million after more than a decade may look pale in an industry of overnight superfortunes, Abacus' real story lies in how the troupe arrived there.

From the start, Konigsberg said, there was a dual agenda: what the business should be and what the business should do with its success.

"We always wanted to be a high-tech multimedia firm," Konigsberg said. Nevertheless, Tulp added, they were building "a vision with a business." She said that it was important to everyone involved to give something back as soon as the business achieved profitability.

Not long after Tulp and friends Eve Furshgott and Lynn Barnes joined in 1973 to publish a local environmentalist newspaper called *The Storefront Classroom,* they leapt into commercial film, video, printing and graphics.

Expansion was slow, however. The organization, which at the time was more or less a collective, was badly undercapitalized. Throughout the 1970s, Konigsberg and the rest of the team that would coalesce into Abacus sought traditional sources of investment money.

Konigsberg recalled a refrain most start-ups grow tired of: No equity, no experience, no loan. But more candid loan officers had another reason to dismiss the fledgling business: "You're a bunch of girls."

Faced with that seemingly unmovable prejudice and unable to continue on "angel" funding from friends and relatives, the team diversified, Konigsberg said.

In 1976, they began a series of enterprises to raise capital. Tulp said the group phased in housecleaning and gardening services. At one point, she explained, the group owned a share in Yellow Cab and carted people around San Francisco. Tulp said they used the experience to learn the basics of running a business.

Meanwhile, Abacus took shape. Tulp signed on in 1977 and now is secretary of the corporation. Deborah Starnes, now the company's treasurer, entered in 1978. Shari Tresky, now president of Abacus, joined in 1979. They and Konigsberg, the vice-president, are Abacus' four principals.

It was the publishing side of business, however, that set the direction and tone for the future of Abacus. Konigsberg said that in 1984, she and her colleagues were frustrated by the inability to take copy produced on an IBM clone in the living room and directly input it to the Com Sat 500 typesetter in the next room.

Abacus found a hardware maker experimenting with an interface board and a software manufacturer working on a typesetting language. Linking their products together, Tulp said, provided "our first multivendor solution, our first proof-of-concept."

Three years later, Abacus shed its side jobs and emerged as an authorized Apple Computer, Inc. reseller. The publishing end of the business was spun off two years ago as Utopian Technologies. Today, Abacus specializes in writing custom software, high-end multimedia projects and networking solutions.

And, in keeping with its founders' vision, Abacus continues to give 10% of its pretax profits to Project Pass. The nonprofit group orchestrates three projects: Third World economic development, cooperative computerized farming and The Young Futurists. Tresky described The Young Futurists as "a club that is going to have chapters for kids who want to map the future." Right now, the idea is being sold to selected San Francisco schools, she said.

Floodgates opening for patent cases

BY MAURA J. HARRINGTON
CW STAFF

Texas Instruments, Inc., which recently won royalties and an extended licensing agreement as the result of a microcomputer systems patent dispute with Tandy Corp., is a case in point of the increased attention the U.S. court system is paying to patents these days.

Because TI won protection for its dynamic random-access memory chips in Japan in a case popularly known as the Kilby Patents suit, the company has been seeking — and gaining — more compensation for its other patents.

The re-routing six years ago of all appeals of U.S. patent cases to the Federal Circuit Court of Appeals in Washington, D.C., has focused judicial attention on the area, incidentally aiding companies that choose to fight firms seeking royalty fees for their patents by making the fight an expensive one, said Rick Wittington, an analyst at Kidder Peabody & Co.

TEXAS INSTRUMENTS has won hundreds of millions of dollars in royalty fees.

Jerry Mills, senior partner at Dallas-based law firm Baker & Botts, said, "Patent cases in the courts have increased a lot in the past six years, [but] we are just beginning to see the impact of the court's actions in this area."

TI's most recent recovery is the 2.5% royalty fee payment, retroactive from June 1989, that it received from Tandy for the use of nine of its basic microcomputer systems patents, a source close to TI said.

TI, which settled with Tandy out of court, was awarded a "significant amount" of money for the settlement compared with what it could have expected just a few years ago, Wittington said.

In the early 1980s, AT&T won about $4 million in royalties for its patent on the original transistor radio, invented in 1948 by William Shockley at Bell Telephone Laboratories. In sharp contrast, TI has won hundreds of millions of dollars in royalty fees over the past few years as a result of litigation over various DRAM and semiconductor patents, according to Mills. Stricter patent rules, he said, could indirectly help spur new technology.

INTERNATIONAL
BRIEFS

Making the best of it

Japan-based **Kubota Computer, Inc.** is the new holder of the exclusive Japanese rights to make and market the RS3230 workstation made by **Mips Computer Systems, Inc.** — the Sunnyvale, Calif.-based reduced instruction set computing (RISC) player in which Kubota is the largest shareholder. According to a Kubota spokesman, next month will mark the first shipments of the systems that will be assembled in Japan from parts imported from the U.S.

Spanish ayes

Software developer and frequent Fortune 100 strategic ally **Carnegie Group, Inc.** recently joined forces with four Spanish organizations in an effort aimed at spreading the use of knowledge-based systems technologies throughout Europe. Casting their respective lots with Carnegie are **IBM of Spain; Banco Bilbao Vizcaya**, one of the country's largest banks; and electric utility company **Iberduero**. The fourth partner is **Socintec**, a research venture attempting to introduce a panoply of new technologies into Spanish organizations with the help of Carnegie Group progenitor **Carnegie Mellon University.**

……

Is it real, or . . .

is it a deal between Tokyo-based **Memorex Telex Ltd.** and Santa Clara, Calif.-based **Memorex Corp.**? The Memorex two have gotten together to create a third company, **Memorex Technologies, Inc.**, based in Santa Clara and poised to sell magnetic tape systems to the U.S. market.

……

To be or not to be

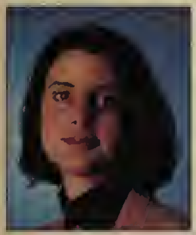
Two Taiwanese computer companies signed on with Scalable Processor Architecture (Sparc) last week, while a duo of trade associations pondered Hamlet's conundrum. Taipei-based **Twinhead International** and **Sampo Technology** pledged allegiance to Sun Microsystems, Inc.'s flavor of RISC, the Sparc processor. Meanwhile, the **Taipei City Computer Association** and the **Taipei County Computer Association**, each of which has voiced interest in creating a science and technology park somewhere in Europe, are trying to decide whether to put resources together toward a single project, or to pursue separate courses.

INDUSTRY

INSIGHT

J. A. Savage

Prodigal Sun going too far?



The local wild cat screeched all night long.

Scott McNealy, Sun Microsystems' chief executive officer, repeated the litany of buzzwords — Sparc, RISC, Unix, standards, Sparc, RISC, Unix, standards . . . like some shrill New Age mantra.

Coincidence? I think not.

"Arrogant" is a word that has often been used to describe McNealy, Sun's corporate culture and marketing strategy. It's an adjective he seems to cultivate. Even the most glancing acquaintance with the company is likely to mean full familiarity with The Attitude.

So, at Sun's recent diskless workstation rollout, I wasn't surprised at what appeared on the surface to be good-natured frat-boy attitudes among McNealy and Sun's other executives. But there seemed to be a mean-spirited current running underneath the jive. Even longtime Sun analysts more used to the arrogance than I were surprised at the tenor of the marketing event.

An introductory video that ridiculed Sun's workstation rivals, saying, "We'll never grow up," was admittedly funny. However, while refusing to grow up may be endearing in the all-too-stuffy business world, acting infantile is another, confided one analyst.

Don't get me wrong: I don't want Sun to go ultra-corporate. But when the company is trying to attract users away from more conservative companies — can you say Hewlett-Packard? IBM? Apple? — users who are used to being treated like paying customers instead of beer-burping buddies at a frat party — how will The Attitude work? Can you say Peoria?

McNealy said he wants to play in the staid old commercial world, the one with the big bucks for business solutions, as well as to service those engineering types who love Sun for its whizziness.

Maybe I'm wrong here, but I regularly visit those commercial types — the ones with the budgets, the pinstripes, the Mercedes and the upwardly mobile information systems careers — and I'm willing to bet that McNealy is going to have to dust off the sand from the playground and speak their language.

He can make fun of Big Blue's attitude, but it's an attitude that sells a whole lot more equipment than Sun does.

At the diskless workstation rollout, for instance, McNealy pretended to have trouble saying Motif, stuttering over it, choking out M-m-m-Motif. He can mock it, insisting on Sun's Open Look — but to users, Motif has become the de facto standard while Open Look is trailing badly in acceptance, largely because it doesn't have all the functions of Motif. M-m-m-Mips Computer Systems got the same treatment.

"They're trying to drive a stake in the ground, driving out competitors by making fun of them," said analyst Kathleen Hurley at Dataquest, who said that such callow showmanship went "too far."

And then there is that insistent whine of buzzwords about open and standard systems.

Sparc, RISC, Unix, standards, Sparc, RISC, Unix, standards . . . could be etched in brass right beneath the McNealy doorplate. But he was just kidding, folks. At the very same event, McNealy announced software packages — one for system/storage management and one to increase database transaction throughput.

And they are not unbundled to run on just any open system, Unix-based hardware. No, they only run on the Sun operating system.

When asked about the contradiction, McNealy said, "It's a value-added unique to Sun." Seems I've heard that before. It has something to do with proprietary software.

Savage is a *Computerworld* West Coast senior correspondent.

Kidding around

Claiming that on-site child care can be responsible for keeping qualified employees at a time when a confluence of economic and industrial trends conspires to place those employees at a premium, Tandem Computers, Inc. is committed to such a plan at its Cupertino, Calif., headquarters.

Tandem will also offer day care at its Watsonville, Calif., manufacturing plant, benefits manager Dee DiPietro said.

"We were looking for ways to differentiate the company to attract the best people," said Susan Cook, vice-president of human resources.

Demographics also contributed to the decision. According to DiPietro, two trends — the increasing number of women in the workplace and an imminent shortage of qualified technologists — make any benefit that will hold onto employees worth its weight in revenue.

Employee desire for on-site child care has been a recurring topic at the executive level for the past few years, DiPietro said. It gained momentum last fall when human resources showed a presentation, "Future Tandem," to its board of directors. Pushed vigorously by human resources over the past three months, the project sailed through Tandem's bureaucracy because "it was sponsored by executives all the way from the beginning, including the chief executive officer," DiPietro said.

DiPietro estimated that about 10% of Tandem's employees need child care but said she expected not all would opt for the employer-provided alternative. "The pilot project will have between 50 and 75 kids," she said. "The master plan for the campus is to have between 200 and 250 [enrolled] in the next five years."

At the headquarters site, day care will not be free, but Tandem has yet to work out how employees will contribute to the facility, DiPietro said. At the Watsonville manufacturing site, care will be provided for free when production crunches require weekend overtime.

Tandem is planning a high-tech twist to the facility. CEO James Treybig "is talking about a bonding area," DiPietro said. "It would not be un-Tandem-like to put in a few terminals at the site so if someone wanted to go have lunch with their kid and take care of some E-mail at the same time, they could."

J. A. SAVAGE

Child care

FROM PAGE 97

Now, nine years later, the company has constructed a 24,000-sq-ft facility — almost five times the size of the original center — with 10 classrooms for infants and 13 classrooms for toddlers. SAS also sponsors an on-site preschool for children between the ages of 3 and 5.

With more than 150 children currently enrolled, the program helps 16% of the company's work force take advantage of this particular employee opportunity. Approximately 1,400 people work on the "campus," the employees' term for the 12-building compound spread out over SAS' 100 acres. The firm employs more than 2,000 people worldwide.

With the opening of the new infant and toddler facility, the combined total enrollment capacity of the three centers is 328 children. An employee must work for SAS for one year before his or her child is eligible for enrollment. Once the application is made, the information is entered into an on-line system, which then determines if space will be available for the child throughout its expected length of enrollment at the centers. The child is then either given a space or placed on a waiting list.

The centers are affiliated with the American Montessori Society, and the majority of teachers are certified Montessori instructors. With assistant teachers and aides supplementing the staff, the caregiver/child ratio is approximately 1 to 3 for infants, 1 to 4 for toddlers and 1 to 8 in the preschool program.

Drake said she finds the individual attention available for her children invaluable. "My son, who is now in kindergarten, went through a hard time during the separation," she said. "The teachers really went the extra mile; they really cared, and that made a big difference."

Having the centers on-site makes a critical difference, Drake said. She credits the close proximity between the parents and the child-care staff as a major factor in fostering close teacher/pupil relationships. If there is a problem or a concern, Drake said, it can be dealt with in a positive, proactive fashion.

Dowty echoed these sentiments. "I was able to nurse both my girls till they were eight months old," she said. "It was just a matter of a phone call to my office, and I could be there in minutes. Now my older daughter and I meet once or twice a week for lunch here at the company cafe. Sometimes we even have time for a walk around the lake before I go back to work."

Enjoying a best-of-both-worlds scenario, Dowty's husband, Larry, is also employed at SAS and can arrange his lunch hours to spend time with his daughter.

Lest critics accuse SAS of stacking the deck in favor of parents at SAS, the company also maintains an on-site health care facility and a comprehensive on-site fitness center and gymnasium for employees.

"There is so much [SAS] has to offer, I don't think anyone feels neglected," Dowty said.

NATIONAL

BRIEFS

Louisville slugger

In the latest news from one of the stronger comeback trails in the computer industry, Louisville, Colo.-based **Storage Technology Corp.** plans to use $104 million of the $275 million raised through a March common stock offering and a May convertible debt offering to retire its existing debt. Storage Tek said that the redemption premium it will incur when the purchase price is paid next month will show up in an approximately $4.6 million extraordinary charge against income for its second quarter ending the 29th of this month. The company said it also expects to save some $25 million per year in lowered interest costs.

……

That's infotainment

Apple Computer, Inc. and **The American Film Institute (AFI)** joined forces early this month to aid and abet the integration of computer technology into film and television. The joint venture, which contemplates a panoply of educational, strategic and developmental initiatives, was launched with Apple's pledge of approximately $1 million worth of Macintosh equipment to the forthcoming AFI/Apple Computer Center for Film and Videomakers, scheduled to open in Los Angeles this fall.

……

Mac is back

R. Douglas MacIntyre, former executive vice-president at Atlanta-based Management Science America, Inc., who carried the same title into MSA's recently merged incarnation as **Dun & Bradstreet Software**, early this month resigned and resurfaced as president and chief operating officer of Hyannis, Mass.-based Software 2000. Company co-founder Robert Pemberton, who cedes two of his titles to MacIntyre, will remain as chief executive officer and chairman of the board of the 9-year-old purveyor of software to the Application System/400 market. MacIntyre, he said by way of welcome, "has been through all of the growing pains associated with taking a $30 million company to $250 million."

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Should you meet the press?

Some managers say publicity helps careers; others refuse to discuss it

BY DAVID A. LUDLUM
CW STAFF

Friends of DuWayne Peterson joke about how often he is quoted in newspapers and magazines. "They ask me, 'Who's your agent?' " says Peterson, who is in charge of operations, systems and telecommunications at Merrill Lynch & Co.

As computer systems become more critical to businesses, information systems managers are more sought after by the media to share experiences and provide insights. Some IS managers, however, opt to appear in the press much less frequently than their responsibilities and accomplishments would allow.

Does the extent to which an IS manager deals with the press affect his career prospects? Some frequently quoted managers say it does, and executive recruiters agree with them. Others are less sure.

"To be known as someone who can speak intelligently about these topics can do nothing but help," Peterson says.

"I would say it's absolutely, critically essential," says Joseph Brophy, once the oft-quoted top IS executive at The Travelers Corp. and now president at Travelers Insurance Co. Speaking with reporters, Brophy says, can help IS managers build confidence by prompting them to communicate their ideas concisely. "It's training, and I think [IS] guys have got to develop that skill."

Executive recruiters say that press coverage prepares IS managers for better job opportunities. "It certainly helps us identify people who are doing good, leading-edge things," says Norman Sanders, a managing director at Russell Reynolds & Associates.

Burt Helgeson, a vice-president at executive recruiter Handy Associates, says speaking to the press can help IS managers convey the notion that they are knowledgeable, articulate and respected in the field.

However, some managers who frequently talk to reporters say they don't think it's a big factor in career advancement. "I've never given it a lot of thought. I don't think it has been an advantage or disadvantage," says Gary Biddle, vice-president of information and systems technology at American Standard, Inc.

Publicity can work for or against a manager, according to Michael Simmons, who is in charge of technology and operations at Bank of Boston Corp. and has been the top systems manager at Bankamerica Corp. and Fidelity Investments.

Simmons and other managers say they feel that colleagues who aim to promote themselves through the media may find the tactic can backfire. Peterson and Brophy use the same term to describe the kind of image that can hurt a manager — braggadocio. The damage can be particularly bad when users don't agree with claims that an IS manager makes through the press, Brophy says.

Managers emphasize that there are reasons other than career advancement for talking to reporters. Although Goldman Sachs & Co., a private partnership, maintains a low profile in the press, top IS executive Rick Adam says management encourages him to publicize IS activities because doing so helps in recruiting college graduates.

Simmons says managers should ensure that people working for them get exposure for their accomplishments. He also advocates sharing ideas. "We need to prevent people from reinventing the wheel," he says. "We need to help people get out of a ditch or prevent them from going into a ditch."

Brophy says the communication can work both ways. Managers being interviewed can ask reporters what other people are thinking and doing. Knowing in advance what a publication is covering can help, too, he says.

> SPEAKING WITH reporters can help IS managers build confidence by prompting them to communicate their ideas concisely.
>
> JOSEPH BROPHY
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Peterson acknowledges that quotes can be personally gratifying. "Everybody likes to be recognized," he says. "It's not bad — the feeling that someone has enough respect for you to call you up and ask your opinion."

Although dealing with the press poses benefits, managers can get burned "if they say something dumb or are misquoted," Sanders says. Dumb things include talking about systems or plans that users would rather keep quiet, Brophy says. As a result, Peterson adds, there is a point at which managers have to say "no comment."

To avoid an adverse impact, some managers spend a lot of time learning to deal with the press. "You really have to work on this," says Peterson, who got training on the subject at Ford Motor Co. At Travelers, Brophy has studied specific situations, including interviews by telephone and in person and coverage by radio and television.

There are also less involved steps that managers take. Adam says he thinks it's a good idea to have quotes read back to him before publication of an article.

Simmons advises reading a publication to get its flavor before being interviewed by it. He also suggests working with public relations people to issue press releases.

Biddle asks reporters about the context of an article and takes notes. If the context is different from what he expected, he might not deal with the reporter again. "Some are easier to work with than others," he says. "They tell you what it is they're trying to achieve."

Four IS managers who rarely deal with the press declined to be interviewed about their reluctance to do so. One, who asked not to be named, said his firm generally avoids publicity to protect proprietary information.

Ludlum is a *Computerworld* senior writer.

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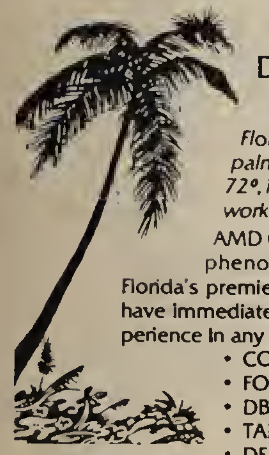

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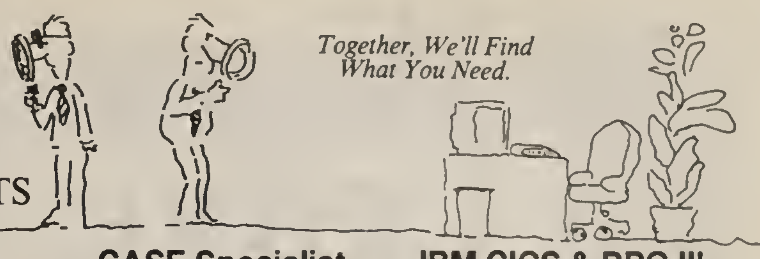

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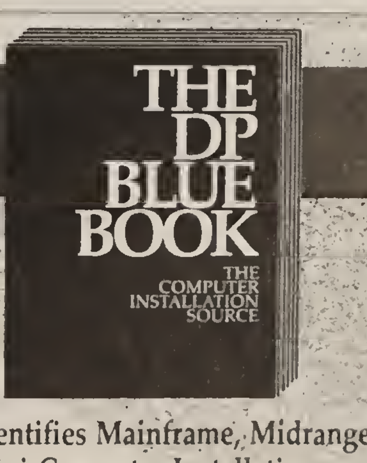

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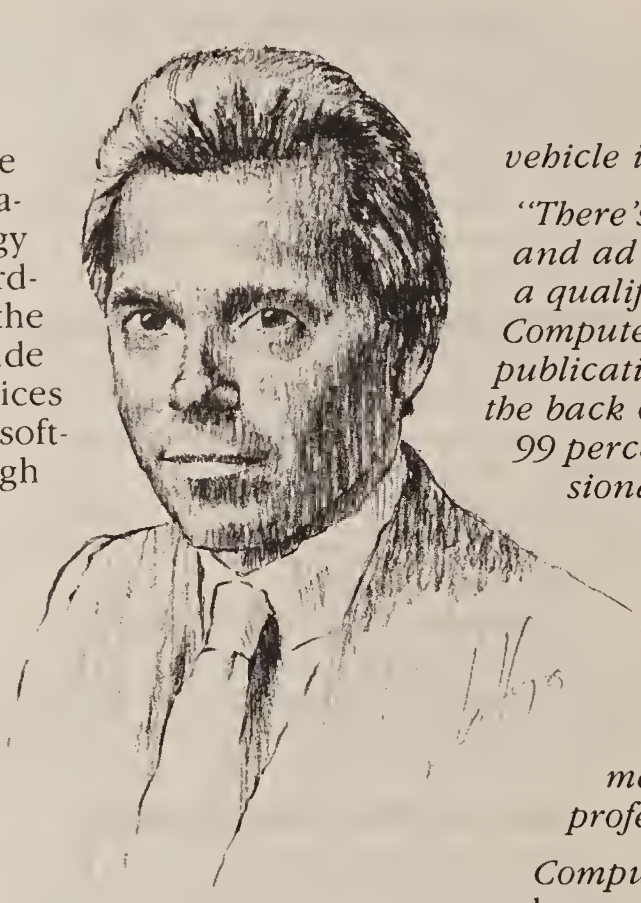

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The official selection process is scheduled to begin in July 1990. Although resumes are currently being accepted, all candidates will be required to submit an official City application and supplement at a later date.

Resumes and inquiries should be directed to:

Gloria Sosa
Personnel Department
Recruitment
Room 100, City Hall South
111 East First Street
Los Angeles, CA 90012

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Systems Security Specialist I/Systems Analyst; 37.5 hrs./wk.; 8:30 am - 5:00 pm; $30,685/yr. Job requires: Bachelors degree in Computer Science **and** 9 months experience as a Programmer. Job also reqs.: 1) Exp. must include exp. using mainframe computers & PC's (personal computers); 2) Exp. must include exp. using MVS, VM/CMS, & MTS operating systems; 3) Exp. must include exp. using a human resource system; 4) Exp. must include exp. using FOCUS computer language for design of database; & 5) 1 college course in technical writing **or** expository writing. Special reqs. 1), 2), 3), & 4) may be met simultaneously during the same 9 month period. Job duties: Analyze, design, & develop applications systems security. Implement new releases of security systems software in a mainframe computing environment. Audit reports & follow-up on security breaches. Process requests for access to systems. Develop computer programs & systems in the VM & MVS environment to assist in managing the security environment. Prepare documentation for systems design including instructional manuals. Serve as technical resource for user community. Qualified applicants should send resume & verification of reqs. to: 7310 Woodward, Rm. 415, Detroit, MI 48202. Ref. #32790. Employer paid ad.

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Minimum three years MVS systems performance and tuning experience with related experience in several of the following areas: MVS (XA or ESA), JES2, TSO/SPF, CICS, DB2, IMS, VSAM, DASD tuning and space management, response time reporting. Interest in also working on AS/400 performance & tuning issues is a plus.

PLANT FLOOR ANALYST

Position involves working on various microprocessors developing plant floor data collection systems. Three or more years experience in UNIX, VMS, Informix, or other relational data base. Knowledge of bar coding technologies a plus.

MANUFACTURING BUSINESS ANALYST

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Knowledge of DA, Information Engineering Techniques and CASE tools. Experience in Entity Relationship Modeling and general knowledge of DP environment required.

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Implementation of computer aided system engineering (CASE) tools, supporting methodologies, and the data inventory system. Experience required in system life cycle methodologies (designing, coding, testing, implementation and maintenance) as related to data processing. Experience with JCL and cataloged job procedures, COBOL, and/or some other 3GL or 4GL which interface with database management systems and TSO or CMS. DBMS experience with IMS and/or DB2 (DB2 preferred), and screen formatting services such as MFS and/or Dialog Manager helpful.

IMS/DB2 DATABASE ADMINISTRATORS

Knowledge of IMS and MVS JCL required. Experience in Physical DB2/IMS database design as it relates to Entity Relationship Modeling. Knowledge of information engineering techniques and CASE tools helpful. IMS DC is implementation vehicle for most IMS and DB2.

SYSTEMS ANALYST

This individual will use information engineering techniques and tools in the development of business systems. Minimum three years experience using structured systems analysis, and design and construction methodologies. Background in COBOL IMS DB/DC programming a strong plus, CASE experience helpful.

INFORMATION ENGINEERING SPECIALIST

This individual will assist in the implementation of information engineering (IE) methodology and the information engineering facility (IEF) for use in all phases of TWA systems development life cycle. Includes developing the enhancements needed to the IE methodology along with integrating that methodology with JAD techniques for use in the TWA environment. Assist in the development and refinement of the IEF and methodology standards, provide methodology and IEF tool consultation to TWA's applications development personnel as needed.

Minimum 5 years experience and structured systems analysis and design. Includes taking a development project from requirements through implementation. Background in programming language COBOL, experience with DB2 in an on-line environment, and PC's is required. Experience with the IEF very desirable.

DEVELOPMENT CENTER ANALYST

This individual will provide technical support to applications developers in the use of development languages and testing tools. Will be required to develop machine/human interfaces to simplify the use of tools by application developers. Minimum 5 years experience in applications development with knowledge of COBOL, ASSEMBLER, and TSO/ISPF Dialog Manager.

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SYSTEMS ENGINEERING

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Systems Software Development Engineers

In this position, you will evaluate, design and develop software user interface tools and applications for PC systems while working in a team oriented environment. You will also coordinate your efforts with a Human Factors and User Interface team as well as other areas within Compaq.

You will need to be familiar with the Intel Processor line and be conversant in Assembler and 'C' programming languages. Experience in designing user interface software and working with Microsoft software development tools is highly desirable. A degree in Computer Science and related course work in user interface areas is preferred, but experience in this field will be equally important.

To apply for the positions listed above, please send resume to: Dept. CW61190-YA.

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Challenge your expertise in high-speed logic design and/or microprocessor system design. Your experience should include vendor libraries, test vector generation, simulation checkout and TTL emulators for gate/array standard cell design. Familiarity with CAE systems used in logic design and documentation is essential. Five years' experience should accompany your BSEE or related degree.

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A variety of opportunities exist for candidates interested in performing electrical and digital design for new product development in an environment where creativity is encouraged.

Requirements include a BSEE (BSEET or BSCS may be appropriate for some positions), between 2-10 years' experience in electrical digital design and an understanding of PC architecture and subsystems. You should also demonstrate an ability to interface comfortably with both engineering and manufacturing teams at all levels. Software experience is a plus.

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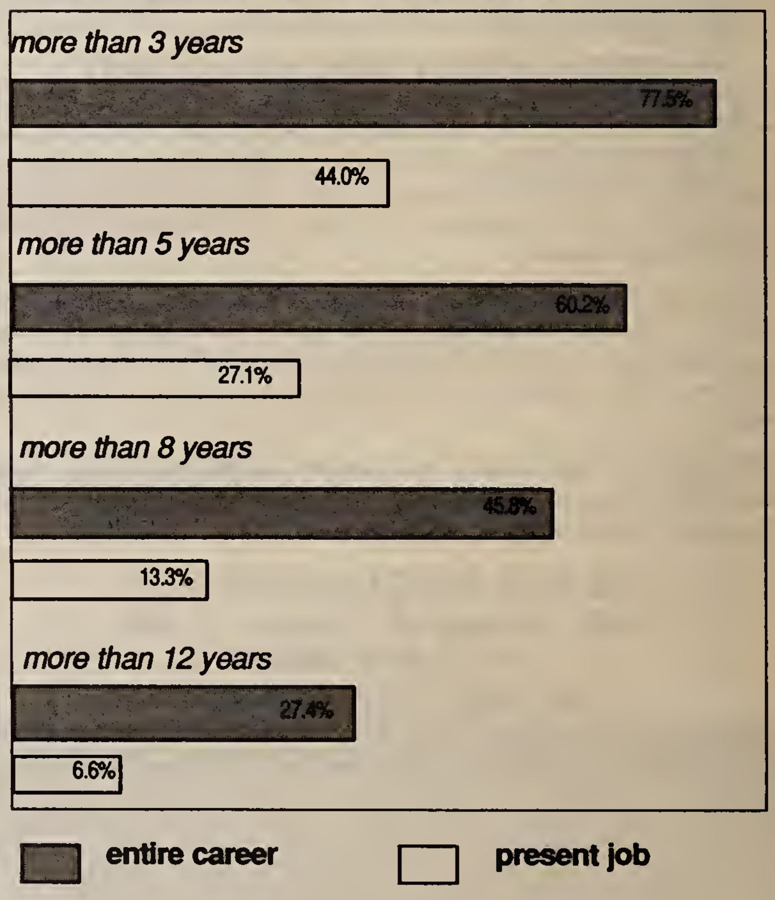

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MARKETPLACE

Getting more from vendors

Suppliers can be coaxed to go to extra lengths for long-term relationships

More and more hardware and software vendors are talking about forging partnerships with their customers. Information systems managers can take their vendors up on the proposition by prodding them to do more than sell and service products. Dennis Murphy, director of corporate information management consulting and support at GTE Corp., is one manager who makes a point of doing so.

Murphy's group serves as inhouse consultant for GTE business units and helps bring in outside consultants when asked to do so. It also reviews requests for the acquisition of computer equipment, makes recommendations about vendors and negotiates volume purchases. Computerworld *Senior Writer David Ludlum spoke to Murphy about getting something extra from vendors.*

Are there ways in which you can get vendors to serve as consultants?
When you are interested in their product, you can get them to configure it for you. You can ask them more general questions [in addition to] specific questions that relate to their product. As part of their marketing activity, they should, if they are good vendors, bring in the proper engineering people, the proper design people and so forth.

How able are vendors to give input on management issues? Chargeback, for example?
You can ask, because they have connections with various companies. Quality is another one; what's the quality process in your company? If the vendors are truly trying to add value and build partnerships, they should respond to those kinds of questions. And not only [with regard to] their company — how they do certain things. They can also link you to other companies that they have observed and get you in contact with those companies.

However, you can't be [too] demanding. It's a two-way street. You have to work with the vendor and develop a relationship under which those kinds of questions are accepted.

Do you get vendors to provide information about their products beyond what they normally would impart to their customers?
Oh, sure. My group in particular is under nondisclosure in many instances. We don't necessarily want to talk to the marketing people. We'd like to talk to the people who designed a product, who are perhaps dealing with a particular problem that we've observed and who understand their process in solving this problem.

Is it possible for the typical MIS director do that?
It should be, but again, it depends on the relationship with a vendor. Vendors that you're not doing a lot of business with aren't going to be as receptive as one that you're doing many millions of dollars with.

That fact suggests centralized procurement is a good idea.
Oh yes, if you can focus the activity of your company, it provides even greater leverage. And that's a benefit to the vendor, too, in one sense. He can leverage his resources in dealing with fewer and fewer people in the company to get his products in, rather than go to each business unit and each division.

How do you try to ensure that the input from a vendor is objective?
Obviously the vendors' motivation is not to provide free service. But to the extent that they feel that [providing information] is building a partnership, then it is an investment in their future position with our company. And those are the vendors that are going to be future vendors for GTE, those that are willing to invest that kind of time.

> IF YOU CAN FOCUS the activity of your company, it provides even greater leverage.

Is sharing information with the vendor's competitors an issue?
We are under nondisclosure, and I think we have developed a great deal of credibility and responsibility, and our vendors treat us as professionals.

Aren't there times, perhaps in a bidding situation, where information will be available to other vendors?
In some cases, a vendor will do a study or collect some data for us and we tell them right up front that our intent is to provide this information to other vendors. As long as you're up front about it and they agree to do it, again they view that as building a stronger relationship with our company. And they feel in that case that they're in the best competitive situation anyway.

Do you expect these extra services to be more common in the future?
There are so many vendors out there with such similar products; with standardization being more and more the way we are doing business, the differentiators are going to be in these other kinds of services that vendors provide. It's going to be harder for them to differentiate on technology.

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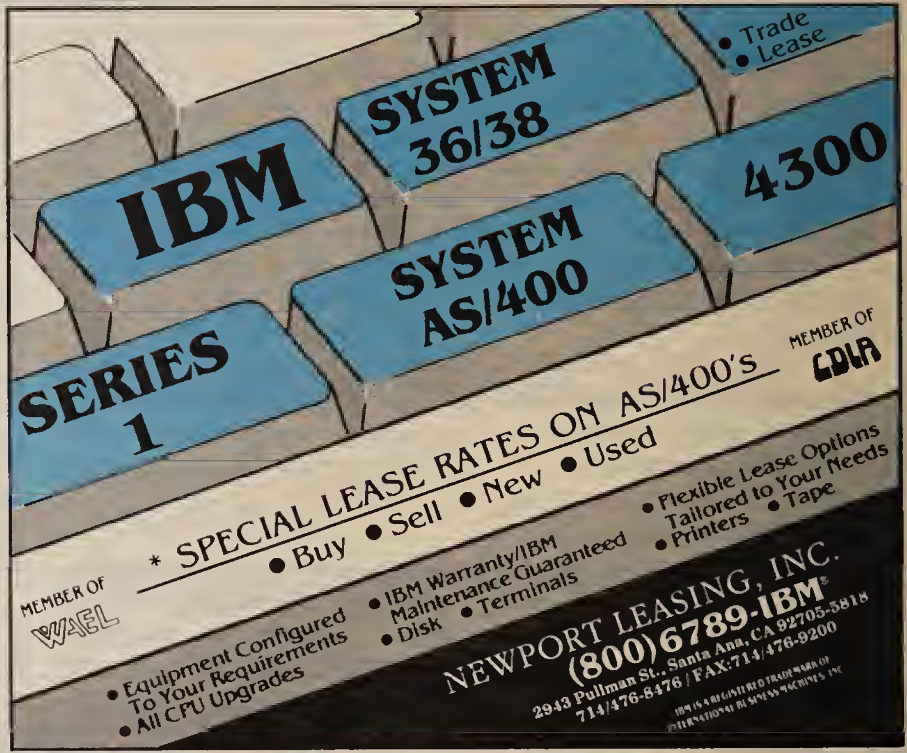
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Calculating training quality

To gauge the value of training, audit students further down the road

BY WILLIAM SEBRELL
SPECIAL TO CW

Most training managers don't realize that the perception of the quality of the instruction they provide rides on the response to one question. I call it the "student's return quotient." It comes when a student returns from a class, often on Monday morning after a five-day program, and the boss walks out of his office and asks, "How was the course?"

Generally, the boss hears one of three responses: 1) The course was great. 2) The course was OK. 3) The course was lousy or, worse yet, worthless.

The boss and the training manager like to hear the first answer. It makes them feel good that the investment in the training was well spent, and it makes the student feel that he owes the organization some work in return for a career boost. The boss also finds the second answer acceptable, although not nearly as rewarding; the student still owes the organization something.

The last answer requires some action. The student must justify his answer, explaining what was wrong and why he feels that way in some detail. Unfortunately, the information he relates to the boss may never get back to the training manager. Even if it does, it may arrive out of context, and it will be secondhand, frequently biased by the boss's perception of what should have taken place. Generally, the training manager becomes defensive; he wants to know why the student didn't say something at the end of the class.

With any of the three responses, the student may judge the quality of the training using criteria with little resemblance to the stated objectives of the class. The student's current work situation, his length of service with the company and his personal relationship with the boss can affect his evaluation.

For example, a boss who always challenges and probes the response of "lousy" will not get as many of those answers as time goes by, even if they are accurate. By the same token, responses of "great" can be suspect, particularly when they come from a new or junior employee.

The student's peers will also ask him about training sessions. They, too, judge programs based on the student's response as they ponder whether to attend the class themselves. Very likely, the answers they get are more accurate. The problem is that no one except the student really knows the grounds on which the comments are based. Both the managers and prospective students are judging the quality of the course against criteria that are not clearly articulated or even easily definable.

The other prevalent benchmark of the quality of training is the course evaluation form, sometimes referred to as the "smile sheet." The form, collected from the students at the end of the class, seeks information about the students, their views of the course material and their perceptions of the instructor.

Typically, a tabulation of these views is the only quantitative measure of the quality of a class that is available to training managers. While most of them acknowledge perils and pitfalls in using the results, they believe it provides the best information readily accessible to them. Since they tend to have little or no control over students, it does tend to provide a reasonable means of measuring quality by providing statistics backed up by raw data. Over time, this system can indicate trends.

There is, however, a new and better approach that is gaining in popularity among sophisticated organizations. Their aim is to find out how relevant instruction has been for students. Six to eight weeks after students have completed a course, these organizations conduct an audit to find out what the students are doing with their new knowledge. They ask questions such as the following:

- Are the students using what they were taught?
- Are they using the right things in the right places?
- If they are not using the information, what is wrong?
- How are they using that expensive handout?

This method can be extremely valuable. It can provide an accurate, quantitative measure of the quality of a course, the value of handout materials and the success or failure of instructors. With the time lag, it tends to minimize problems of personality conflict between students and an instructor. It quickly identifies training that students (or their bosses) have put to use for a purpose other than the one that the corporation intended.

Training organizations can conduct these audits with forms, by telephone or in person With all of the information these audits provide, it is surprising that they are still the exception rather than the norm.

Most organizations measure the quality of training at the end of a course and during the first day a student is back on the job. The quality can and should be measured later in the learning cycle — six to eight weeks later. Astute training managers will utilize all three means of measurement to improve the quality of their programs.

Sebrell is a vice-president at Data Base Management, Inc., a subsidiary of American Management Systems, Inc. in Manchester, Conn.

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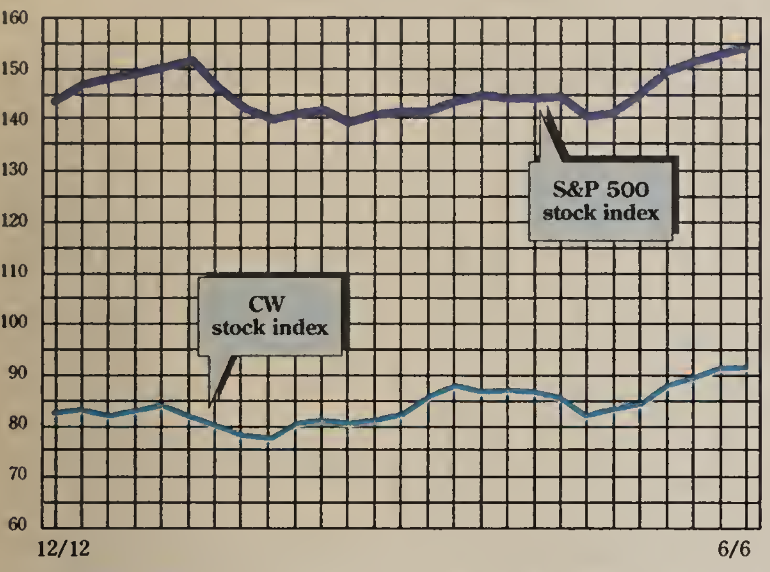
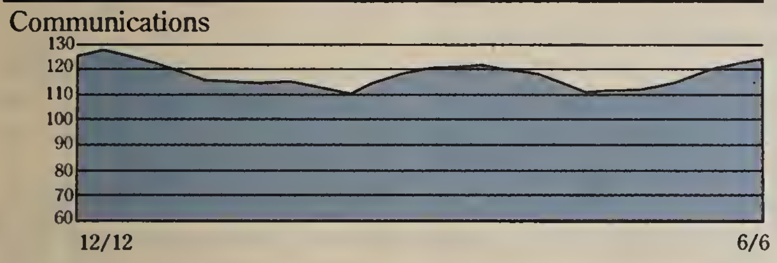
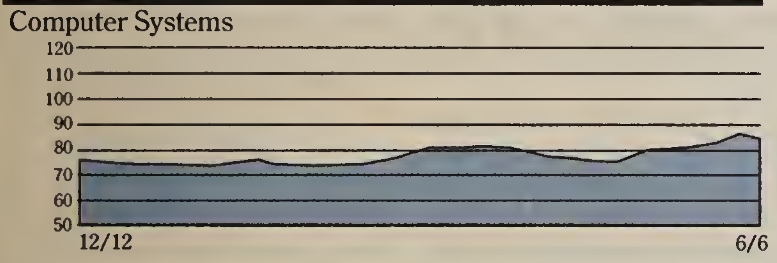
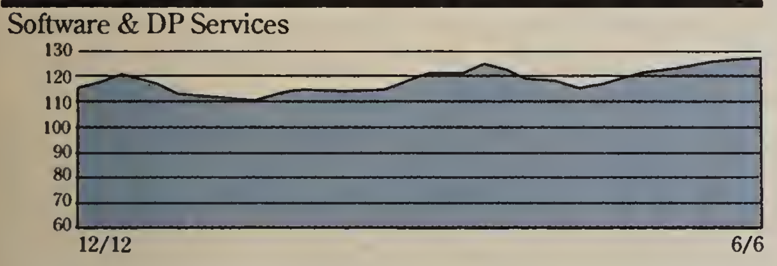
STOCK TRADING INDEX

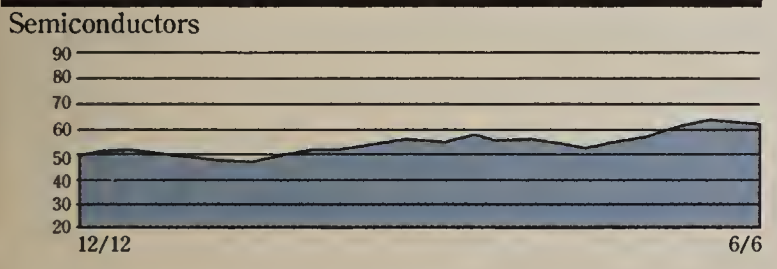


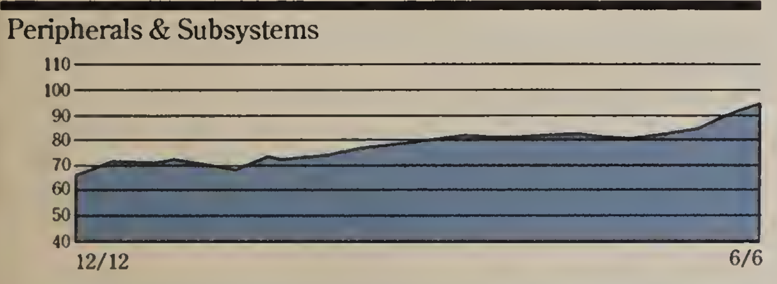
Indexes	*Last Week*	*This Week*
Communications	122.9	**124.1**
Computer Systems	88.0	**86.5**
Software & DP Services	128.7	**129.3**
Semiconductors	62.8	**62.3**
Peripherals & Subsystems	92.0	**95.2**
Leasing Companies	82.3	**82.6**
Composite Index	90.4	**90.8**
S&P 500 Index	152.1	**154.0**

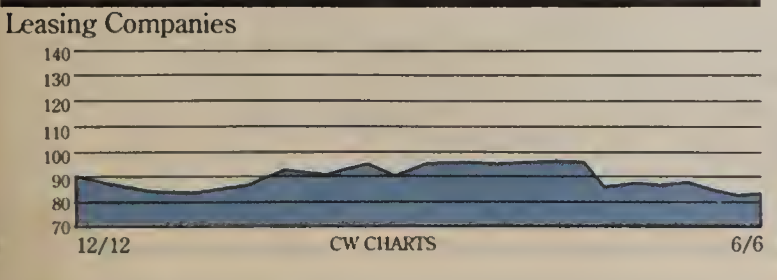












Computerworld Stock Trading Summary

CLOSING PRICES WEDNESDAY, JUNE 6, 1990

Communications and Network Services

EXCH		52-WEEK RANGE		PRICE CLOSE JUNE 6, 1990	PRICE WEEK NET CHNGE	PRICE WEEK PCT CHNGE
N	AMERICAN INFO TECHS CORP	68	55	65.375	0.9	1.4
Q	ANDREW CORP	26	20	23	0.5	2.2
Q	ARTEL COMM CORP	10	5	5.5	-0.9	-13.7
N	AT&T	47	35	42.625	-0.1	-0.3
Q	AVANTEK INC	7	2	2.875	-0.4	-11.5
N	AYDIN CORP	21	14	14.75	0.6	4.4
N	BELL ATLANTIC CORP	57	43	52.25	0.3	0.5
N	BELLSOUTH CORP	59	46	57	0.8	1.3
Q	COMPRESSION LABS INC	16	7	14	1.0	7.7
Q	CONTEL CORP	37	23	30.625	2.3	7.9
Q	DATA SWITCH CORP	5	2	3.375	0.1	3.8
Q	DIGITAL COMM ASSOC	27	17	24.125	-1.1	-4.5
Q	DYNATECH CORP	21	15	15.75	0.3	1.6
Q	FIBRONICS INTNL INC	9	5	9.125	0.4	4.3
Q	GANDALF TECHNOLOGIES	7	2	3.125	0.2	6.4
N	GENERAL DATACOMM INDS	7	3	4.125	0.3	6.5
N	GTE CORP	72	52	64.875	-0.3	-0.4
Q	INFOTRON SYS CORP	13	4	4	-0.1	-3.0
N	ITT CORP	65	51	58.25	1.5	2.6
N	M A COM INC	9	3	5.25	0.5	10.5
Q	MCI COMMUNICATIONS CORP	49	31	42	-1.3	-2.9
N	NETWORK EQUIP TECH INC	34	9	10	-0.6	-5.9
Q	NETWORK SYS CORP	15	7	14.875	1.4	10.2
N	NORTHERN TELECOM LTD	30	18	29.25	2.3	8.3
Q	NOVELL INC	51	24	49.75	-1.5	-2.9
N	NYNEX CORP	92	75	88.75	1.3	1.4
N	PACIFIC TELESIS GROUP	52	39	46.875	0.6	1.4
A	PENRIL CORP	7	4	7	0.0	0.0
N	SCIENTIFIC ATLANTA INC	29	17	27.25	-0.5	-1.8
N	SOUTHWESTERN BELL CORP	65	50	57.625	-0.5	-0.9
Q	3 COM CORP	21	10	13.5	-0.8	-5.3
N	U S WEST INC	41	33	37.875	0.9	2.4

Computer Systems

EXCH		52-WEEK RANGE		PRICE CLOSE JUNE 6, 1990	PRICE WEEK NET CHNGE	PRICE WEEK PCT CHNGE
Q	ALLIANT COMPUTER SYS	8	4	7.375	-0.5	-6.3
Q	ALPHA MICROSYSTEMS	8	3	3.625	0.0	0.0
Q	ALTOS COMPUTER SYS	8	5	5.25	-0.1	-2.3
A	AMDAHL CORP	23	11	15.375	-0.8	-4.7
Q	APPLE COMPUTER INC	50	32	39.5	-1.9	-4.5
Q	AST RESH INC	26	7	24.625	-0.5	-2.0
N	BOLT BERANEK & NEWMAN	9	4	4.875	-0.1	-2.5
N	COMPAQ COMPUTER CORP	126	73	123.125	3.6	3.0
N	COMMODORE INTNL	18	6	8.5	1.0	13.3
N	CONTROL DATA CORP	23	16	20.125	-0.9	-4.2
N	CRAY RESH INC	54	31	50.5	3.3	6.9
Q	DAISY SYS CORP	5	0	0.438	-0.1	-17.5
N	DATA GEN CORP	19	8	11.875	1.0	9.2
N	DATAPOINT CORP	6	2	3	0.1	4.3
Q	DELL COMPUTER CORP	13	5	10.875	-0.5	-4.4
N	DIGITAL EQUIP CORP	103	70	90.25	-2.8	-3.0
N	FLOATING POINT SYS INC	4	0	1.75	-0.1	-6.7
N	HARRIS CORP	40	28	35.875	0.9	2.5
N	HEWLETT PACKARD CO	58	40	48.875	0.9	1.8
N	HONEYWELL INC	103	73	99.875	-0.4	-0.4
N	IBM	122	93	120.625	-0.3	-0.2
Q	INFORMATION INTL INC	16	12	13.25	0.3	1.9
Q	IPL SYS INC	14	5	9.875	-0.4	-3.7
N	MAI BASIC FOUR INC	7	2	2.5	-0.3	-9.1
N	MATSUSHITA ELEC INDL LTD	180	123	144.125	-1.9	-1.3
Q	MENTOR GRAPHICS CORP	26	14	25.75	1.6	6.7
N	NBI INC	3	0	0.156	-0.1	-37.6
N	NCR CORP	72	53	68.25	-0.9	-1.3
Q	PYRAMID TECHNOLOGY	36	10	32.75	-2.3	-6.4
Q	SEQUENT COMP SYS INC	33	11	32	1.5	4.9
Q	SHAREBASE CORP	3	0	0.469	-0.1	-11.7
Q	SUN MICROSYSTEM INC	33	13	31	0.5	1.6
Q	SYMBOLICS INC	2	0	0.563	0.0	0.0
N	TANDEM COMPUTERS INC	30	17	24.875	-3.5	-12.3
N	TANDY CORP	49	30	35.875	-1.3	-3.4
N	ULTIMATE CORP	12	5	6.625	-0.3	-3.6
N	UNISYS CORP	28	12	15.375	1.0	7.0
A	WANG LABS INC	9	4	4.5	0.5	12.5

Software & DP Services

EXCH		52-WEEK RANGE		PRICE CLOSE JUNE 6, 1990	PRICE WEEK NET CHNGE	PRICE WEEK PCT CHNGE
Q	AMERICAN MGMT SYS INC	16	11	14.375	-1.0	-6.5
Q	AMERICAN SOFTWARE INC	26	14	24.25	-0.1	-0.5
N	ANACOMP INC	7	2	3.125	0.4	13.6
Q	ANALYSTS INTL CORP	20	14	19.75	1.0	5.3
Q	ASHTON TATE	23	9	11.75	-0.4	-3.1
Q	ASK COMPUTER SYS INC	15	7	9.5	-0.1	-1.3
N	AUTO DATA PROCESSING	59	39	57.125	-0.1	-0.2
Q	AUTODESK INC	53	33	49.5	-1.5	-2.9
Q	BMC SOFTWARE INC	28	12	26.875	2.1	8.6
N	BUSINESSLAND INC	14	7	9.125	0.1	1.4
Q	COGNOS INC	9	4	8.625	0.1	1.5
N	COMPUTER ASSOC INTL INC	21	11	16.25	1.1	7.4
Q	COMPUTER HORIZONS CORP	16	7	14.75	0.5	3.5
N	COMPUTER SCIENCES CORP	59	40	48.75	-0.5	-1.0
N	COMPUTER TASK GROUP INC	14	9	11.5	0.1	1.1
Q	COMSHARE INC	23	15	21.25	-21.8	-50.6
Q	CORPORATE SOFTWARE	16	8	13.25	-0.3	-1.9
N	GENERAL MTRS (CLS E)	37	24	35.125	-0.5	-1.4
Q	HOGAN SYS INC	7	4	3.875	-0.4	-8.8
Q	INFORMIX CORP	17	8	16.5	1.3	8.2
Q	INTELLICORP INC	7	3	7	0.1	1.8
Q	LEGENT CORP	32	19	25.625	-0.9	-3.3
Q	LOTUS DEV CORP	39	21	37.125	-0.6	-1.7
Q	MICROSOFT CORP	79	26	73	-2.5	-3.3
Q	NATIONAL DATA CORP	35	13	15.5	0.3	1.6
N	ON LINE SOFTWARE INTL INC	11	6	7.75	0.0	0.0
Q	ORACLE SYS CORP	28	15	21.125	1.5	7.6
N	PANSOPHIC SYS INC	19	10	12.125	-1.6	-11.8
Q	PHOENIX TECHNOLOGIES INC	14	2	3.625	0.9	31.8
Q	POLICY MGMT SYS CORP	42	28	40.75	1.8	4.5
Q	PROGRAMMING & SYS INC	25	16	23.5	1.3	5.6
Q	RELATIONAL TECH INC	11	5	7.5	0.1	1.7
N	REYNOLDS & REYNOLDS CO	33	19	23.25	0.6	2.8
Q	SAGE SOFTWARE INC	16	7	14.75	0.4	2.6
Q	SEI CORP	21	15	20	-0.1	-0.6
Q	SHARED MED SYS CORP	18	12	13	0.1	1.0
Q	SOFTWARE PUBG CORP	28	13	26	-0.8	-2.8
N	STERLING SOFTWARE INC	11	7	10.375	-0.6	-5.7
Q	SUNGARD DATA SYS INC	26	15	22.75	1.4	6.4
N	SYSTEM CENTER INC	26	17	22.125	1.4	6.6
N	SYS. SOFT INC	29	14	26.75	0.8	2.9
Q	WORDSTAR	3	1	1	-0.1	-5.9

Semiconductors

EXCH		52-WEEK RANGE		PRICE CLOSE JUNE 6, 1990	PRICE WEEK NET CHNGE	PRICE WEEK PCT CHNGE
N	ADV MICRO DEVICES INC	11	7	10.25	-0.5	-4.7
N	ANALOG DEVICES INC	12	7	8.5	0.6	7.9
Q	ANALOGIC CORP	11	9	8.75	-0.3	-2.8
Q	CHIPS & TECHNOLOGIES INC	26	15	19	-1.3	-6.2
Q	INTEL CORP	49	28	47.75	-0.1	-0.3
Q	MICRON TECHNOLOGY INC	26	7	14.25	0.3	1.8
N	MOTOROLA INC	86	51	83.25	1.3	1.5
N	NATL SEMICONDUCTOR	9	5	8	-0.4	-4.5
N	TEXAS INSTRS INC	44	28	41.25	-1.1	-2.7
A	WESTERN DIGITAL CORP	13	6	13.125	0.1	1.0

Peripherals

EXCH		52-WEEK RANGE		PRICE CLOSE JUNE 6, 1990	PRICE WEEK NET CHNGE	PRICE WEEK PCT CHNGE
Q	ALLOY COMP	3	0	0.813	-0.1	-13.3
N	AM INTL INC	6	2	2.125	-0.1	-5.6
Q	AUTO TROL TECH CORP	5	2	3.5	0.5	16.7
Q	BANCTEC INC	24	13	23.5	1.1	5.0
A	COGNITRONICS CORP	8	3	4.75	-0.4	-7.3
Q	CONNER PERIPHERALS	26	10	24.875	0.1	0.5
A	DATARAM CORP	17	8	14.625	-1.9	-11.4
N	EASTMAN KODAK CO	52	36	41.875	0.8	1.8
N	E M C CORP MASS	7	3	6	-0.1	-2.0
Q	EMULEX CORP	10	4	5.75	0.0	0.0
Q	EVANS & SUTHERLAND	35	17	30.875	-1.4	-4.3
Q	ICOT CORP	3	1	1.25	-0.1	-9.1
Q	INTERLEAF INC	9	5	7.75	1.4	21.6
Q	IOMEGA CORP	6	3	4.188	-0.3	-6.9
Q	LEE DATA CORP	4	1	1.563	0.1	4.2
Q	MASSTOR SYS CORP	4	1	1.313	0.0	0.0
Q	MAXTOR CORP	17	7	15.75	-0.3	-1.6
Q	MICROPOLIS CORP	9	3	8.625	0.6	7.8
N	MINNESOTA MNG & MFG CO	86	68	84	1.4	1.7
Q	PERSONAL COMP PRODUCTS INC	5	4	4.063	0.1	1.6
Q	PRINTRONIX INC	15	7	14.125	0.9	6.6
N	QMS INC	19	8	17.875	-0.1	-0.7
Q	QUANTUM CORP	23	9	20.25	-1.0	-4.7
N	RECOGNITION EQUIP INC	13	5	4.75	-0.1	-2.6
Q	REXON INC	10	6	8.625	-0.9	-9.2
Q	SEAGATE TECHNOLOGY	20	10	15	0.1	0.8
N	STORAGE TECH CORP	33	9	32.125	1.8	5.8
Q	TANDON CORP	3	0	2.563	-0.3	-8.9
N	TEKTRONIX INC	24	12	13.875	-1.0	-6.7
Q	TELEVIDEO SYS INC	1	0	0.5	0.3	128.3
N	XEROX CORP	69	46	47.5	1.0	2.2

Leasing Companies

EXCH		52-WEEK RANGE		PRICE CLOSE JUNE 6, 1990	PRICE WEEK NET CHNGE	PRICE WEEK PCT CHNGE
N	CAPITAL ASSOC INTNL INC	8	3	3.125	0.3	8.7
N	COMDISCO INC	34	17	19.125	-0.1	-0.6
Q	LDI CORPORATION	18	13	15	0.0	0.0
Q	PHOENIX AMERN INC	5	3	3.875	-0.3	-6.1

EXCH: N = NEW YORK; A = AMERICAN; Q = NATIONAL

Tumbleweeds

Prices toss and turn during dry spell in technology sector

Maybe it was the full moon, but technology trading was more odd than usual last week. Prices were a mishmash of ups and downs by Thursday's close.

Take the hardware arena: IBM gained 1 point to close at 120⅝. Sun Microsystems, Inc. also advanced, finishing up ⅛ of a point at 31⅜. Digital Equipment Corp., on the other hand, took a 1⅜-point blow, falling to 89⅜. Apple Computer, Inc. dipped as well, down 1¾ points to 39. Hewlett-Packard Co. managed a neat trick amid all the hocus-pocus, though, climbing 1⅞ points to 49⅝.

Discombobulation hit the software sector, too. Investors seemed spooked by Microsoft Corp., sending it down 3⅛ points to 72. Computer Associates International, Inc., however, picked up 1⅝ to close at 16½. News of two big licensing contracts helped pull Adobe Systems, Inc. up 1 point to 35¾. Novell, Inc. crept 1⅞ of a point to 50¼, while Lotus Development Corp. lost 1 point to end at 36¼.

Elsewhere, Motorola, Inc. jumped 3⅞ to 85⅞, while competitor Intel Corp. dropped ⅝ of a point to 46⅞. National Semiconductor Corp. also lost ground, slipping ⅞ of a point to 7. Cray Research, Inc. gained 1⅝ points to finish at 50⅛, while Cray Computer, Inc. dipped ⅝ of a point to 12⅜.

KIM S. NASH

Outsourcing

FROM PAGE 1

tempered by advice to those thinking of jumping aboard the bandwagon. Above all, the advice was, make sure the vendor knows who is in control.

"The buck still stops with the IS manager," said Herbert Chaplin, vice-president of group IS at American Ultramar Ltd. in Tarrytown, N.Y. "Once you outsource, don't turn your back on the fact that it's still your stuff being processed. The vendor may run the help desk, but you can't abdicate your responsibility for problem management."

Ann States

Bank South's Cisewski: *Control is critical for successful outsourcing*

Chaplin estimated that the company's American Ultramar, Inc. oil refining and marketing unit in Long Beach, Calif., will save about $1.5 million in the fiscal year that began last Oct. 1 by contracting its processing to Dallas-based Power Computing Co.

Lack of control can quickly spoil an outsourcing relationship, as NHP, Inc. found out the painful way. The Washington, D.C.-based rental housing firm settled a lawsuit last year against Electronic Data Systems Corp. and has returned to in-house processing (see story below).

"The organization loses control of its IS department, and the easy way to fix that is to outsource it," said Leslie Burke, NHP's vice-president of MIS. "Then, the same thing starts happening at the outsourcer."

The recent phenomenon of outsourcing contrasts with other contract services such as systems integration or software development, which tend to be limited-run deals that augment internal IS resources for specific projects. Outsourcing in its current form means a long-term agreement, such as five or 10 years, for a vendor to take over pieces of IS that had been done by in-house staff. Common examples include data center operations and network management.

Drawing a very sharp line between what is "outsourceable" and what is not is critical for maintaining control, said Fred Cisewski, senior vice-president and director of MIS at Bank South NA in Atlanta. For Cisewski, outside involvement in Bank South's applications development was verboten from the beginning.

"Applications are what differentiates us from other banks; other than that, we're all the same," he said. "I think you can outsource anything that's a commodity; if it's not, then you can't."

Bank South signed a 10-year processing contract last fall with a new player in the outsourcing game — IBM, with Computer Task Group, Inc. as a subcontractor. Cisewski enthusiastically claimed that the deal will save $25 million to $45 million over the next decade, enabling Bank South to hold projected annual IS budget increases to 3% or less.

Don Winski, executive director of corporate IS at Time Warner, Inc. in New York, agreed that firms must make the commodity/noncommodity distinction — and it isn't always easy. Warner Communications outsourced the management of its voice network to MCI Communications Corp. and is saving 10% to 20% on telecommunications costs, but Winski said he has preferred to keep data communications in-house for now.

"For Warner, voice is really back-office and operations support and lends itself to an economies-of-scale and business-efficiency approach," Winski said. "The data network is more closely aligned with our products and services, more time-critical in its strategic implications. To hand that over to an outside vendor may not be worth the risk."

Getting what you paid for

Many who have chosen outsourcing emphasized one point — that they did *not* go with the lowest bidder. "Low bid is not the issue," Chaplin said. "Much more important than the price is the feeling and confidence that the firm will perform at least as well as your own staff."

Cisewski was even more blunt, saying that because of the long-term commitment, "I don't think you'd want to put this out to the lowest bidder."

For smaller or less strategic outsourcing projects, however, price can be a critical factor. The Ryland Group, Inc., a Columbia, Md.-based house building firm, outsources only its IBM-based general ledger processing, keeping all other Hewlett-Packard Co.-based processing in-house. Although systems manager Tom Isabella said he was pleased with vendor Litton Computer Services, Inc., he went with a lower bid from Martin Marietta Corp.'s information systems group when the Litton contract ended.

Such competition among outsourcing vendors on both price and service is healthy, according to IS executives. At Time Warner, Winski said, he lets MCI know that he has regular conversations with AT&T and U.S. Sprint Communications Co. Cisewski said it is not that different from making IBM aware that you are also looking at Amdahl Corp. or Hitachi Data Systems Corp. mainframes or using third-party maintenance firms. "You have to put them in a competitive position," he said.

As outsourcing heads into its second year as a major issue among IS executives, the basic question remains the same: Are the risks worth the rewards?

"For me, the savings needed to be significant enough," Cisewski said. "I thought we should save about 20%, but there's no one formula. That's just a gut feeling."

National correspondent Mitch Betts and staff writer Sally Cusack contributed to this report.

How to do it

The following is a summary of advice from information systems executives who have committed to outsourcing during the past year or so:

- Carefully assess which pieces of IS are strategic and which are commodities more suitable for outsourcing.
- In a large-scale contract, do not automatically choose the lowest bidder. Confidence in the vendor and relationship intangibles are more important than price.
- Do not view outsourcing as a solution for an IS function that is out of control.
- Keep the vendor — both before and after the contract is signed — in a competitive position.
- Have a solid plan of scheduled communication with the vendor. Example: American Ultramar holds biweekly face-to-face meetings with Power Computing.
- Choose a vendor that you are confident will do more than just live up to the contract, particularly in response time to problems.
- Research and resolve all human resource issues, such as the impact on health insurance and other benefits for affected employees, before announcing an outsourcing deal. Be prepared to work overtime reassuring IS staffers as the rumor mill cranks up.

CLINTON WILDER

A dissatisfied customer

At least one user would be happy never to hear the word outsourcing again.

Leslie Burke, vice-president of MIS at Washington, D.C.-based NHP, Inc., said she considers outsourcing a big failure, mostly because the business loses control of its IS function.

One thing that goes out of control is costs, she said: "It's not in the service provider's best interests to cut costs. They make money when costs go up." NHP found that its IS budget was cut by 52% when it made the move in August 1987 from an outsourcing contractor to an in-house data center.

Katherine Lambert

NHP's Burke

The relationship between NHP and its contractor, Electronic Data Systems Corp. (EDS), soured and led to litigation. The lawsuit was settled last year "without any admission of liability on either side, and both parties have agreed not to discuss it," EDS spokesman Randolph Dove said.

With outsourcing, NHP's IS costs were "increasing tremendously every year," and the company felt it had very little control over the IS staff and operations, Burke said. She added that another problem was handing the IS function over "to people who don't really know your business," leading to dissatisfaction at the business units.

Burke previously worked at systems integrator American Management Systems, Inc., where she was the project manager in charge of helping NHP convert from outsourcing to an in-house data center. In December 1988, she jumped to NHP.

MITCH BETTS

Taking the plunge

The following is a sampling of companies that have embarked on outsourcing agreements during the past year or so:

- **American Ultramar Ltd.:** Began data center operations contract with Power Computing Co. on Oct. 1, 1989. Estimated annual savings of $1.5 million, mostly in staffing.
- **Bank South NA:** One of three large banks — the others being Hibernia Corp. in New Orleans and First Tennessee National Corp. in Memphis — to outsource processing to IBM last year. Unique to Bank South was IBM's construction and operation of a new Bank South data center near Atlanta's Hartsfield International Airport.

  Approximately 80 Bank South operations personnel were hired by IBM subcontractor Computer Task Group, Inc. Other savings in hardware: Bank South needed to upgrade its IBM 3084 QX, so IBM installed a 3090 Model 200J in the new data center. Estimated total savings of $25 million to $45 million over the 10-year contract.
- **Ryland Group, Inc.:** Contracted out general ledger processing to Martin Marietta Corp. last year. Unspecified savings over previous contract with Litton Computer Services, Inc.
- **Time Warner, Inc.:** Warner Communications unit contracted out voice network management to MCI Communications Corp. Estimated savings of 10% to 20%.

Moscow on the Mississippi

Gorbachev evaluates Control Data's nuclear reactor safety system

BY ELLIS BOOKER
CW STAFF

MINNEAPOLIS — The visit was brief, lasting only 20 minutes, but Soviet President Mikhail Gorbachev's appearance last week at Control Data Corp.'s (CDC) headquarters spoke volumes about his country's interest in U.S. computer technology.

The Soviet leader came to CDC — the only business headquarters to receive a visit from the Soviet president during his U.S. tour — for a brief demonstration of a CDC system that would be used for safety analyses of Soviet civilian nuclear power plants, according to a pending agreement.

Gorbachev, whose nation suffered the world's worst nuclear reactor tragedy during the Chernobyl incident in 1986, said his country "cannot do without nuclear energy today," adding that it was important to make plants as safe as possible.

Standing in a packed, three-story gallery at CDC's Bloomington, Minn., headquarters, Gorbachev witnessed a brief demonstration on a Cyber 962 mainframe that had been moved to the spot especially for the ceremony.

New beginning

The pending deal with CDC is "the beginning of cooperation" toward a common hardware and software platform for U.S. and Soviet computing, according to Yevgeni Velikhov, a vice-president at the Soviet Academy of Sciences and Gorbachev's adviser on energy and computer technology.

Asked about Soviet policy toward buying technology from the West, Velikhov told *Computerworld*, "[For success] in the computer area, you must use all the achievement of the world market. If you only concentrate on chips and components, you fail. No country can produce everything." The Soviet Union uses Japanese memory chips, too, he said.

Conformance to international standards is clearly where the Soviets are headed when it comes to personal computers. Velikhov said that in early 1981 he demonstrated an IBM PC in Moscow and advocated using Western standards and technology to build Soviet systems.

The government, however, opted for a totally homegrown approach. The result, the science adviser said, was a computer with "small memory and few applications." Velikhov estimated that there are perhaps 500,000 to 700,000 of these systems in existence. Originally, he said, the government had wanted to produce one million machines annually, giving half of them to schools.

"We now will develop only MS-DOS machines," Velikhov said, adding that there are perhaps 300,000 to 400,000 IBM XT- and AT-class PCs in the Soviet Union today. However, because of their high price — 50,000 to 80,000 rubles — they are used mostly by programmers for software development, noted Velikhov, who himself has access to both an Intel Corp. 80286-class PC and an Apple Computer, Inc. Macintosh.

The Soviets are attempting to purchase a nuclear power plant management software system and six CDC 962 mainframes on which to run it. The $32 million sale, announced in December, is still subject to the approval of U.S. government agencies over usage safeguards, as well as approval by the Coordinating Committee on Multilateral Export Controls (see story below).

CDC officials said last week that final approval of the sale is imminent. Five of the machines would go to Soviet reactor design laboratories; a sixth would be used for research connected to the Chernobyl cleanup.

Gorbachev, *center, with CDC President Lawrence Perlman at his arm, views Cyber demo*

Gorbachev offers red carpet to U.S. high-tech business

BY JAMES DALY
and JIM NASH
CW STAFF

Computer industry executives say that although significant trade barriers have been stripped away, doing business with the USSR will be an evolutionary, rather than revolutionary, process.

Soviet President Mikhail Gorbachev last week offered open arms and a red carpet during a low sweep into California and charmed normally skeptical executives with specific business incentives — including low taxes in the early years of a joint venture, repatriation of profits and protection of property.

"We will be moving toward a new format of economic life," he said during a luncheon address to the San Francisco Chamber of Commerce. "We will be creating the infrastructure that will open up the road to market relations."

Apple Computer, Inc. President John Sculley noted that the new policies Gorbachev described were "significant changes" from Gorbachev's stance of only a few months ago. Apple already has its foot in the door in the Soviet Union, having donated a number of Macintoshes to the Soviet Academy of Sciences and sold machines to the USSR through the firm's European offices, according to an Apple spokesman.

Others were careful not to hang too much on Gorbachev's personality, saying that significant economic rough spots still need to be smoothed.

Tandem Computers, Inc. Chief Executive Officer James Treybig expressed concern not just about getting products into the Soviet Union but also about providing adequate support and service after installation. "There is a great potential, but some things would have to change in order for us to do business there," Treybig said.

Significant doubts also remain about the ability to convert rubles into hard currency. "We welcome any development that helps trade, but we're not particularly interested in situations where we have to accept vodka in exchange for chips," a spokesman at Advanced Micro Devices, Inc. in Sunnyvale, Calif., said.

Other executives said the hard currency issue was not as important as establishing an early presence. "Our plans are to reinvest our [Soviet] revenues, so having a convertible ruble is not so important to us," Oracle Systems Corp. CEO Lawrence Ellison said. "Three to five years from now, we'll have a solid business in the Soviet Union, and we can repatriate our dollars then."

For some segments of the industry, getting in early still means waiting. Local-area networking, for example, must wait until personal computers become more commonplace before charging in with connectivity solutions.

Eric Benhamou, president of 3Com Corp. in Santa Clara, Calif., said his company is anxious to break into the Soviet market — but not until it is clear what technology is needed. In the short term, Benhamou said, 3Com will seek an international partner that has had more experience with the Soviets to assist in its entrance.

Chip makers may be forced to take an even longer term look at marketing to Soviet consumers because they continue to face sticky export controls. While PCs containing U.S.-made chips can be sold in the Soviet Union, exports of most chips are still restricted by the Coordinating Committee on Multilateral Export Controls and domestic export regulations. A spokesman for Intel Corp. in Santa Clara, Calif., said his firm is still limited to exporting nothing more than its 80286 chips.

Gorbachev was the first Soviet leader to get a close-up look at U.S. high-tech since Soviet Premier Nikita Kruschev visited an IBM disk drive manufacturing plant in San Jose, Calif., on Sept. 21, 1959.

After this visit, the Soviets will open a full-time sales office at the Techmart, an office building primarily used by high-tech companies in Silicon Valley.

Senior West Coast Editor Jean S. Bozman also contributed to this report.

Western allies loosen controls

BY GARY H. ANTHES
CW STAFF

PARIS — The U.S. and 16 allies agreed last week to substantially ease restrictions on the sale of computers and telecommunications gear to Eastern Europe and the Soviet Union.

The Coordinating Committee on Multilateral Export Controls (Cocom) agreed to allow free trade of computers with a processing data rate of up to 275M bit/sec., up from the current threshold of 78M bit/sec.

The revised level includes all personal computers equivalent to 33-MHz Intel Corp. 80386-based PCs, said Cesare Rosati, an official at the U.S. State Department. Cocom also agreed to give licensing consideration to exports for civilian use of computers up to 1G bit/sec., encompassing nearly all computers except supercomputers and large mainframes, he said.

Just one month ago, the Bush administration had proposed a ceiling of 550M bit/sec. for the higher threshold.

The agreement further provides for relaxation of controls up to 2G bit/sec. to Eastern European countries that are able to provide various safeguards and assurance of civilian use, Rosati said.

Deregulation of telecommunications equipment exports went even further, eliminating most controls on most items. Sales of a few items to the Soviet Union, such as fiber-optic systems, will still be barred, Rosati said.

Last week, the U.S. Commerce Department said it would block a proposal by US West to install a $500 million fiber-optic network across the Soviet Union with links to Japan and three European points.

In a separate but related action, the U.S. House of Representatives last week voted on its own liberalized version of export controls, although it plans to limit sales to the Soviet Union until the country agrees to end its economic sanctions against Lithuania.

The administration opposed the House bill, saying it would hamper its ability to conduct foreign policy, and the president has threatened to veto it if it comes to him in its current form.

Reporters' notebook

Baby, please don't go: The Interface Group did not go down without a fight in face of IBM's virtually last-minute decision to pull out of Comdex/Spring '90. Interface Group Chairman Sheldon Adelson reportedly flew a team down to Armonk, N.Y., in an effort to negotiate a deal that would keep the show's anchor in place. IBM stuck by its guns, giving the nod instead to next week's PC Expo show. No one is quite sure why, or who ordered it, but it appears that all IBM speakers at Comdex were also withdrawn. IBM still got some cheap mileage out of Comdex by inviting the press to briefings at its Atlanta multimedia center.

■

Every which way you turn: This was not exactly Comdex's year. The good news was preregistration was high, and the show spilled over into the nearby Infomart for the first time ever. However, Comdex/Spring has wandered in recent years between Atlanta and Chicago and fell victim to poor scheduling in 1990.

The show formally started on Sunday, although some events took place on Saturday. The beginning of the show, which has never been held this late in the year, coincided with the Consumer Electronics Show. Worse, Comdex preceded PC Expo by a mere two weeks. Among the officially missing luminaries were Microsoft Corp., Compaq Computer Corp., Lotus Development Corp. and Novell, Inc. The result was summed up Tuesday by two registering attendees. After looking around, one remarked to the other, "There's no one here!" Sixty thousand attendees were expected.

■

Start me up: Fujitsu passed on the mantle for the most sexist promotion, awarded at Comdex/Fall '89, to reseller High Tech Computer Products, Inc., which this year resorted to life-size cheesecake to hype its wares. Large posters of a blonde, comely woman, nude save for strategically placed strips of paper, encouraged attendees to come by High Tech's booth to get "the whole picture." The unveiled poster barely manages to advertise the company's products by somewhat covering the model's charms: She cradles a board across her chest and another piece of equipment against her buttocks. And no, the booth was not jammed.

■

Sign o' the times: The litigation-happy computer industry has spawned not another lawsuit, but a book designed to prevent them. *The Multimedia Producer's Legal Survival Guide* is written for those who meld video, audio, animation and special effects. "We hope this guide helps people focus on the important work of developing content, rather than on the annoying nuts and bolts of securing rights," said publisher Nick Arnett, president of Multimedia Computing Corp.

■

Money too tight to mention? The used microcomputer market is red-hot, according to the National Computer Exchange (Nacomex). The urge to recycle hardware is driving a 40% annual increase in used computer sales; the market has grown 590% over the past five years, Nacomex added. Noting that a used computer is often only months behind the leading edge, Nacomex is predicting that for every 10 new micros sold this year, four used boxes will be purchased.

■

Best use of a captive audience: The support mavens at Wordperfect Corp. unveiled "Hold Jockey." Customers holding on any of the developer's toll-free support lines will hear a disc jockey play music and commercials for Wordperfect products and release dates. "Traffic reports" will let users holding in each support group know how much longer they'll have to wait.

■

The world is your office: KASE Communications Corp. introduced the "world's first office in a briefcase." The $7,500 unit consists of either an Intel Corp. 80286 or 386SX-based computer with a 40M-byte dirve and 1M byte of random-access memory, an IBM Color Graphics Adapter-compatible display, 9.6K bit/sec. fax capability, an ink-jet printer, cellular phone and 2,400 bit/sec. modem in a battery-powered, executive-size briefcase weighing 22 pounds. KASE founder Gary Flaherty, who bills himself as "a protege of the late An Wang," claimed his luggable package will "revolutionize" the way we work, allowing more telecommuting and enhancing the paperless office by eliminating data translation bottlenecks.

AT&T

FROM PAGE 1

Unix solution on the server that will dominate, then they can go in and argue the Unix case on the client," said Will Fastie, editor of the Baltimore-based "The Fastie Report" on personal computers.

AT&T's Starserver line will also heighten the competition in the fledgling multiprocessing LAN server market. A key factor in determining market share over the next 12 months will be distribution, an area in which AT&T and its two key competitors — Compaq Computer Corp. and Netframe Systems, Inc. — have varying degrees of problems, analysts said.

However, it will likely be year's end before AT&T can make much of an impact, since users will have to wait until the fourth-quarter release of AT&T Unix System V, Release 4.0.3, before they can reap the full benefits of symmetrical multiprocessing or run AT&T's version of a Unix LAN Manager on those servers.

Users seeking symmetrical multiprocessing today for Intel Corp.-based computers can turn to Sequent Corp., which provides it on a large 386 multiprocessor box.

A buoyant AT&T went gunning for the absent Compaq's Systempro and Netframe's namesake server with the two-tiered, Intel I486-based Starserver family. The first models will ship in July, supporting AT&T Unix System V, Release 4.0 (see chart) and including the following features:

- The Starserver E will feature true symmetrical multiprocessing across three configurations, eventually providing up to 106 million instructions per second on a four-CPU system.
- The Starserver FT family will offer fault-tolerant networking.

A third server option is the AT&T 6386/25 small computer systems interface (SCSI) server, which headed a list of SCSI-related add-ins for AT&T's Workgroup Systems Computers.

AT&T executives stressed two themes: providing more pieces to its networking puzzle and maneuvering Unix, via a departmental server, into the office. While the announcement does broaden AT&T's ability to respond to customers' network needs, it is questionable how much AT&T has managed to leapfrog Compaq and Netframe.

Although all the AT&T servers are Intel I486-based, Compaq is expected to release the Systempro/486 at next week's PC Expo show in New York. While the Systempro will support OS/2 or DOS clients, the Starserver only supports DOS clients under AT&T's Simultask software for now, an AT&T spokesman said.

As with the Systempro today, the initial Starserver E models will ship with uniprocessor support only — despite AT&T's emphasis on multiprocessor support. The Systempro needs either OS/2 Version 2.0 or Netware 386 Release 3.2 to provide multiprocessing support, and neither product will ship until sometime next year.

Netframe offers multiprocessing today on Intel 80386 and I486 models that run either Novell, Inc.'s Netware 386 or OS/2 LAN Manager on top of Netframe's proprietary server software. The 486-based Model NF400 can support up to eight processors, and pricing starts at $45,000. Neither the Systempro nor the Netframe has been able to penetrate the market to any great extent.

Reaching for the stars

Multiple I486 processors and RISC chips are at the heart of the new AT&T server line

	Star Server E	Star Server FT
CPU	Intel I486, 33 MHz	Mips R2000
Number of processors	1-4	3
Memory	8M-16M bytes	16M-40M bytes
Disk storage	300M bytes - 1.2G bytes	Dual 295M-byte drives
Operating system	Unix System V, Release 4.0	Unix System V, Release 3.1.1
Base price	$27,500 - $39,900 (one CPU configuration)	$172,000 (operating system, $12,000 additional)

Source: AT&T

CW Chart: Doreen Dahle

Communications cornucopia

Comdex/Spring '90 attendees were treated to some cutting-edge communications products, including 100M bit/sec. connectivity, a new twist on token-ring adapters and the third in a series of recently introduced IBM 3270 emulation packages that run under Microsoft Corp.'s Windows 3.0.

Thomas-Conrad Corp. announced delivery of TCNS, a 100M bit/sec. network for point-to-point communications that is said to offer an average cost per connection as low as $1,281.

An extension of existing token-passing technologies, TCNS uses a distributed star topology and includes Arcnet features. It does not require specialized software and can be bridged to other protocols such as Ethernet, Arcnet and token-ring, in some cases. It supports up to 255 nodes, a network span of 20,000 feet and distances up to 5,000 feet between devices and connects via fiber-optic cable according to the vendor.

The TCNS product family includes adapters for Industry Standard Architecture (ISA)-compatible 16-bit and 32-bit computers, an eight-port diagnostic Smart Hub and Hubtalk, a network hub manager.

Separately, Digital Communications Associates, Inc. (DCA) jumped into the IEEE 802.5- and 802.2-standard token-ring market but added a few twists.

Slated for fall shipment, the Irmatrac card takes advantage of DCA's patented convertible board technology, which allows users to put the same card into either an ISA or IBM Micro Channel Architecture computer. The board is configured without DIP switches. Analysts praised the card, predicting it will find favor in shops with a mix of ISA and Extended ISA hardware.

At $895, Irmatrac also gives users a choice of 4M or 16M bit/sec. connectivity. Separate removable Ring Interface Modules (RIM) on the card support either 4M bit/sec. connection over shielded or unshielded twisted-pair cable or 16M bit/sec. transmission over shielded cable. As new media connections are introduced, such as fiber optics, users will be able to upgrade their cards by popping in a new RIM.

Following similar announcements from Wall Data Corp. and DCA, Eicon Technology, Inc. unwrapped a Windows 3.0-compatible 3270 card, available next month.

Access for Windows reportedly provides full 3270 host connectivity while simultaneously taking full advantage of Windows 3.0's graphical user interface, unrestricted use of memory and Dynamic Data Exchange. Users can tap into an IBM host via 3270-emulation while concurrently processing other windows applications on the personal computer.

PATRICIA KEEFE

Comdex attendees met by storage to spare

BY PATRICIA KEEFE
CW STAFF

ATLANTA — Desktop and portable computer users slaked their thirst for ever more storage and memory capacity with a flood of offerings at last week's Comdex/Spring '90.

Among the more notable storage quenchers were the following firsts:

- Archive Corp.'s 6.5G-byte digital audio tape (DAT) storage.
- Brier Technology's 25M-byte unformatted floppy disk drive and disk featuring proprietary Twin Tier Tracking (T^3) technology.
- Infochip Systems, Inc.'s noiseless random-access data-compression expansion card.
- Pioneer Communications of America's rewritable/write-once multifunction optical-disc drive for both magneto-optical and write-once, read-many (WORM) media.

Designed for unattended backup applications, Archive's Pythonsle DAT system runs at a speed of 650M bytes per hour, allowing users to back up more than 6G bytes of data overnight. It uses a magazine of five 1.3G-byte DDS DAT cassettes. It is scheduled to be available to developers in the third quarter of 1990.

The Flextra 3½-in. drive and floppy drive both use T^3 technology, which sends a continuous signal to the read/write head, virtually eliminating errors, Brier Technology claimed. Q/Cor retails the Flextra drives at prices ranging from $795 to $995; the disks cost $25.

Infochip's Expandz card reportedly increases data storage capacity by a factor of three and provides extended error-free storage for the IBM Personal Computer XT, PC AT and compatibles.

The single half card is said to eliminate the 32M-byte barrier for MS-DOS 3.X. It offers compression/decompression for hard and floppy disks without degrading user response time. The card costs $199.

Users of Pioneer's Rewritable/WORM Multifunction Optical Disc Drive will be able to select either temporary (rewriteable) or permanent (write-once) storage, Pioneer President Peter Imamura said.

The Rewritable/WORM Multifunction Optical Disc Drive is capable of writing data to and reading data from both types of disks, and its single drive switches modes through commands generated automatically by the host computer. Pricing starts at about $4,500.

Also with an eye on optical drives are Panasonic Communications & System Co. and Micronet Technology, Inc.

Panasonic introduced what it claimed is the first commercially available multifunction rewritable optical drive that uses the newly developed phase-changing technology.

The LF-7010 rewritable optical-disc drive uses phase-change technology to overwrite data in one pass onto an optical disc; magneto-optical drives require two passes. It supports up to 1G byte of storage or 500,000 pages of mainframe output. The LF-7010 is scheduled to ship in the fourth quarter and is priced at $5,000.

Vendors launch 486-based flagships

BY RICHARD PASTORE
CW STAFF

It seems Intel Corp. I486 chips have become status symbols for personal computer makers. Vendors from the big guys to the small fry flaunted 486s like hood ornaments at their Comdex/Spring '90 introductions last week.

It does not seem to matter that most users are not ready for the power of a 486 box, according to observers. Indeed, 486 chips reportedly represent only 3% to 5% of Intel's shipments. Yet, "Every vendor wants to say they have a 486," said Bill Lempesis, an analyst at Dataquest, Inc. in San Jose, Calif.

Advanced Logic Research, Inc. (ALR) tried to one-up Compaq Computer Corp.'s multiprocessor Systempro by unveiling its own multiprocessor box. Unlike the dual-processor Systempro, ALR's Multiaccess Series 3000 can accommodate up to six 25-MHz or 33-MHz 486 chips.

The ALR system also features the small computer systems interface (SCSI) bus master and 13 AT and C bus combination slots. Configured in a minicomputer-style chassis, it can accommodate seven full-height and five half-height devices and an integrated uninterruptible power supply.

The system is expected to ship in the fourth quarter and will be priced under $16,000.

Acer America Corp. designed its new 486 PC with a compact desktop footprint rather than the tower configuration popular for many 486 units. The Acer 1170's performance is reported to exceed 11 million instructions per second. It is slated for availability sometime in the third quarter.

ALR's *Multiaccess Series 3000 multiprocessor system*

A 25-MHz 486 desktop unit and a 33-MHz 486 tower model were unveiled by Televideo Systems, Inc. Both machines feature a 32-bit SCSI.

The San Jose-based company's systems also support an optional 32-bit Ethernet board. The desktop and tower PCs are priced at $8,995 and $10,995, respectively. They will be available in the third quarter, the company said.

Tatung Company of America, Inc. hedged its bets with both Extended Industry Standard Architecture (EISA) and IBM Micro Channel Architecture (MCA) 486 introductions. The Long Beach, Calif.-based firm promised the MCA machine will ship in the third quarter, while the EISA box will follow in the fourth.

Not content with EISA and MCA, Tatung also showed off a Sun Microsystems, Inc. Scalable Processor Architecture-compatible PC slated to ship in the third quarter.

Intel 486 upgrade boards were also in evidence at the show. Bala Cynwyd, Pa.-based Feith Systems and Software, Inc. introduced a user-installable 486 upgrade for AT&T's 6386 WGS computers. The board is expected to cost $5,295.

Olivetti still trying to crack U.S. market

BY PATRICIA KEEFE
CW STAFF

While AT&T stood tall at Comdex/Spring '90 in Atlanta last week, its former desktop supplier was quietly scrambling for a toehold in the U.S. market under a new name and strategy.

U.S. vendors may be moving overseas, but Olivetti Office, a major force in Europe, has been trying — with little success — to accomplish the reverse for a number of years now.

Olivetti has a lot of global customers that are moving into the U.S., said John Dunkle, an analyst at Workgroup Technologies in Hampton, N.H. "That's why Bull [HN Information Systems, Inc.] was extremely smart to pick up Zenith, with its U.S. name-brand recognition," he added.

Analysts said last week that a reorganized Olivetti Office USA is hampered by second-tier distribution and a close-to-saturated U.S. personal computer market.

Olivetti unleashed a wave of products, ranging from 16-MHz Intel Corp. 80286-based PCs to a 33-MHz Intel 80386-based computer as well as laser and dot matrix printers. Some of these products are already available in Europe. Among the products unveiled were the following:

- A family of Industry Standard Architecture (ISA) 386-based computers, including the 33-MHz M380/XP, the 25-MHz M380/XP7, the midrange 16-MHz Intel 80386SX-based M300 and the compact 16-MHz PCS 386SX. Also offered with IBM Micro Channel Architecture are the 16-MHz 386SX-based P500 and the 25-MHz 386-based P800.
- Two ISA-bus 286-based computers.

IBM reduces PS/2 prices

BY RICHARD PASTORE
CW STAFF

WHITE PLAINS, N.Y. — IBM cut prices last week from 4% to 10% on Intel Corp. 80286- and 80386SX-based Personal System/2s. Analysts said the reductions are a reaction to increased competition, particularly in the SX market.

"Certainly there's more competition in the SX market," said Bill Lempesis, an analyst at Dataquest, Inc. in San Jose, Calif. "A lot of the clone systems out there are much cheaper than IBM."

Market watchers pointed out that customers can now buy a well-equipped SX machine from a clone vendor for $1,500 to $2,000. Even with a 10% reduction, IBM's PS/2 Model 55 SX 031 costs $3,495.

IBM may also be reacting to the latest wave of personal computer price cuts by its competitors. Last month, Compaq Computer Corp. unveiled a cut-rate workstation line [CW, May 21]. AST Research, Inc. last week — as well as Dell Computer Corp. a week earlier — chopped prices by approximately the same margin as IBM.

Some analysts further speculated that IBM's pricing moves could indicate pending PS/2 low-end introductions. One likely new model could be based on the recently introduced Intel 20-MHz 386SX, one pundit predicted.

Rumors are still flying that IBM will announce a PC for the home market priced under $1,000. The latest scuttlebutt has the machine debuting in time for Father's Day, which is Sunday. It will be sold through mass merchandisers as well as through traditional channels, and it will ship standard without a hard disk, analysts said.

An IBM spokeswoman would not comment on the unannounced product but said that the price cuts were made to keep the PS/2s "competitive with the market."

IBM also cut the price of its 16-MHz Model 55 SX 061 by 9.3% to $3,895, excluding a monitor. Other reduced PS/2s included the Model 30 286 E21 (reduced 4% to $2,345); the Model 50Z 031 (cut 5% to $2,745); and the Model 50Z 061 (reduced 8.5% to $3,195).

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TRENDS

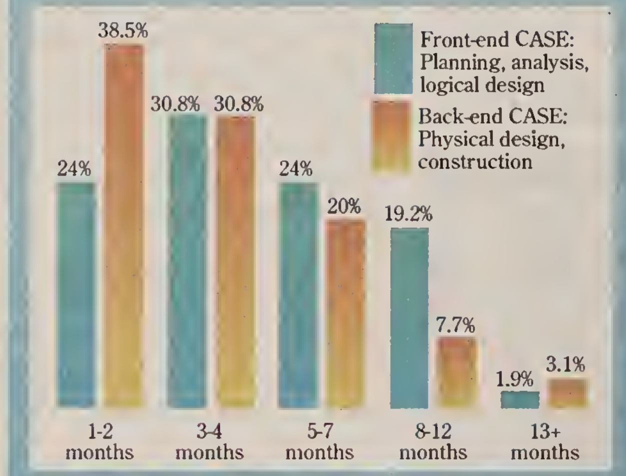
CASE

Although CASE has been touted as one of the most promising approaches to improving software development and has been able to enhance software quality for most users, the general readiness for the technology remains low

Time to reach full proficiency

Because it's easier to implement and requires less organizational change, developers reach proficiency more quickly with back-end CASE than with front-end CASE

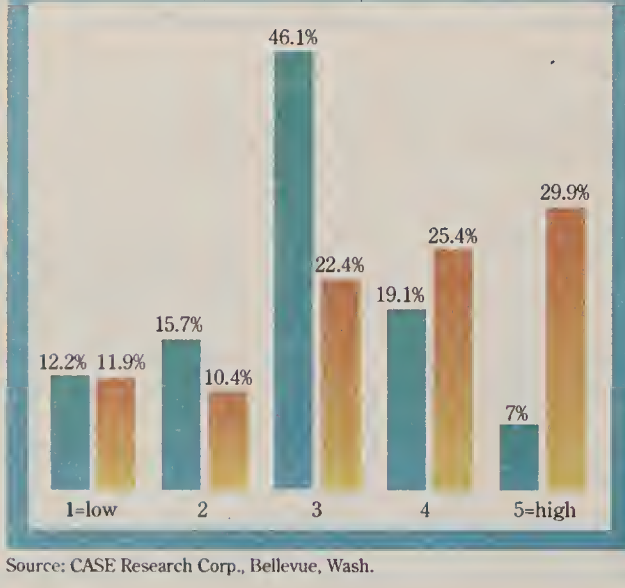
(Bases: 104 front-end, 65 back-end users)



Success with CASE

Overall success with CASE is relatively moderate to high. Because of the shorter learning curve, users generally consider themselves to be more adept with back-end CASE

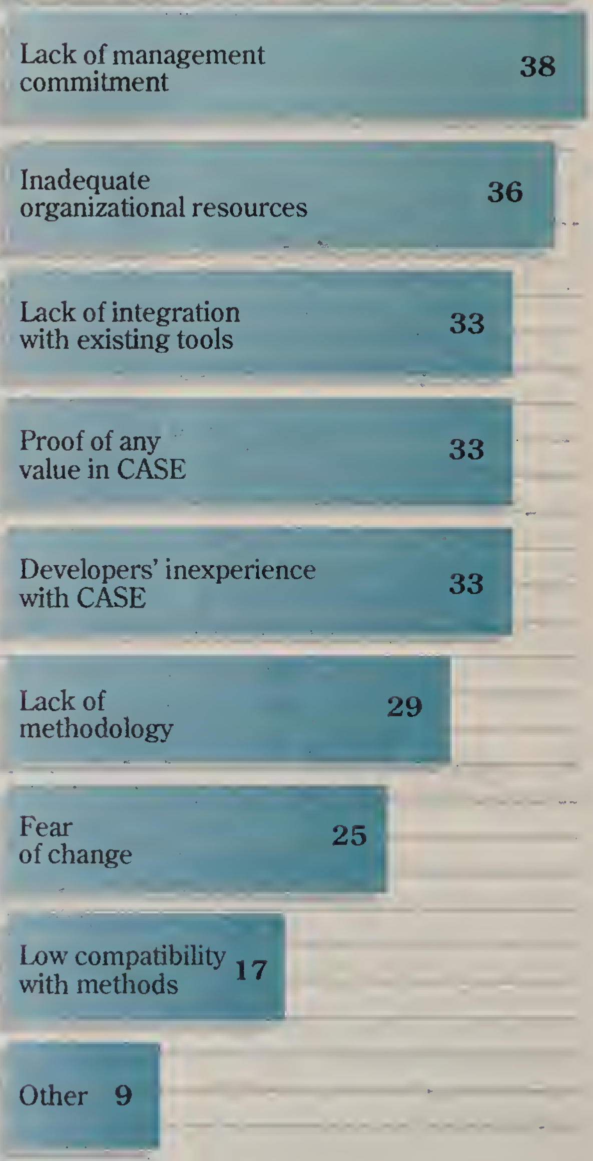
(Bases: 115 front-end, 67 back-end users)



Main obstacles to adoption

Factors holding back CASE adoption in many companies are generally the same ones holding back any innovation — lack of commitment from the people upstairs and lack of experience with the new technology

(Number of respondents: 253)



Source: CASE Research Corp., Bellevue, Wash.

CW Chart: Tom Monahan

NEXT WEEK

In with standards is the new rule of thumb at Security Pacific Corp.'s global trading organization. The bank is currently setting up a client/server architecture with a relational database management system at its foundation, according to Vice-President of Facilities and Technology **Richard J. Harmel.** Read about it in Systems & Software.

Alan Levenson

Are you credible? When you promise to deliver a project, do bosses roll their eyes and employees snicker? Good credibility can make or break an IS career. Fortunately, the delicate art of credibility *can* be learned. The secret? Asking the right questions, meeting deadlines and focusing on customer service. See how in In Depth.

INSIDE LINES

Hooked on a feeling

Silicon Valley is so pumped up by Mikhail Gorbachev's cheerleading tour that a reciprocal trip is already in the works. An organizer of the junket said a blue-ribbon committee of 100 West Coast computer executives will storm the Soviet Union in October.

The IBM bundle

If the rumor mill is to be believed, next week's PC Expo will be the site of a number of announcements. IBM is expected to announce the PS/1 home computer, an entry-level Intel 80286-based system with a monochrome color graphics adapter, 640K bytes of memory, a 20M-byte hard disk, a 101-key keyboard and a 2.4K bit/sec. modem. It will be priced under $1,000 and come bundled with Prodigy.

LiTE and SXy

Compaq will unveil a laptop personal computer based on Intel's 20-MHz 80386SX chip next week, according to sources who have received invitations to the coming-out party. Rather than basing it on the popular LTE notebook configuration, Compaq will likely stuff the SX chip into its SLT form factor.

Underpower tower ramp-up

What Compaq's Systempro and start-up firm Netframe don't need right now is more competition, since neither has been able to penetrate the market to any great extent. According to John Dunkle, an analyst at Hampton, N.H.-based Workgroup Technologies, Compaq has managed to sell only about 1,500 Systempros in the first half of 1990 — half of what Dunkle said Compaq expected to sell. Netframe has had even greater difficulty establishing itself.

The OS/2 interface finally wins one

Unisys Corp. will take a run at OS/2 and IBM next week, opening up its CTOS client/server systems. Unisys will publish the first set of applications programming interfaces for the 286- and 80386-based CTOS workstations. It's said that CTOS/Open will latch onto Microsoft's Presentation Manager as the standard user interface for all future applications.

They got something for U

The Lotus announcements of the week include the rollout of an AT&T Unix System V version of 1-2-3 and, separately, some news from the government spreadsheet division. Lotus' 1-2-3/U will support Unix System V, Version 4.2.

Down in Dodge City

Although Frank Dodge, former co-founder and president of McCormack & Dodge, is laying low this year with a Dun & Bradstreet noncompete pact hanging over his head, it is said that between golf games, he has been gathering up potential investment promises for his new software company, which he will not talk about until next year. Dodge has been telling former employees that he has $100 million in venture capital.

Open and shut

The OSI Network Management Forum is expected to finally lay out all the pieces of its OSI-based network management system this Friday. "This is the finished product," a Forum representative told us, including the international standard versions of Common Management Information Protocol and Services and conformance test specifications co-developed with the Corporation for Open Systems and the European standards body, SPAG.

Let Sematech be the memorial for the late Robert Noyce, Noyce's widow Ann Bowers told President George Bush, who had called Bowers to offer his condolences, according to an Intel spokesman. The President asked what he could do for her, and she let him have an earful. The spokesman said that when Bush said he has always been a Sematech supporter, Bowers asked him to share that enthusiasm with the rest of his administration. If you think one hand doesn't know what the other is doing, contact us and we'll try to clasp them together. Contact News Editor Pete Bartolik at 800-343-6474, fax a note to us at 617-875-8931 or message COMPUTERWORLD *on MCI Mail.*

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